PROJECT: 44-01

RCRA FACILITY INVESTIGATION
PHASE I RELEASE ASSESSMENT REPORT
SAFETY-KLEEN CORP. SERVICE CENTER
PEKIN, ILLINOIS
(ILD093862811)

January 27, 1995

Submitted by:

Safety-Kleen Corp.
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cc: Peoria
USEPA

safety-kleen.

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January 27, 1995

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Douglas W. Clay, P.E.
Hazardous Waste Branch Manager
Illinois Environmental Protection Agency
Permit Section
Division of Land Pollution Control
2200 Churchill Road
P.O. Box 19276
Springfield, IL 62794-9276

Subject: Phase I Report and Final Quarterly Progress Report, RCRA Facility (RFI) Investigation, Safety-Kleen Corp. Service Center, Pekin, Illinois (ILD093862811)

Dear Mr. Clay:

This letter constitutes a RCRA Facility Investigation (RFI) Quarterly Progress Report for the Safety-Kleen Corp. (S-K) Service Center in Pekin, Illinois. This quarterly report covers the period from October 1 to December 31, 1994. The first quarterly report for this investigation covered the period from June 21 to September 30, 1994, and was submitted to the Agency on October 24, 1994.

The final Phase I RFI Report and certifications (in accompanying binder) are being submitted along with this quarterly report. In accordance with Condition 15 of the RFI Workplan approval letter, this will be the final quarterly report. One original and two copies of all documents are being submitted in accordance with the conditions of the RFI Workplan approval letter.

Description and Estimate of Percentage of Phase I RFI Completed

The Illinois Environmental Protection Agency (IEPA) approved the RFI Workplan with conditions in a letter dated June 21, 1994. The schedule of work approved as part of the RFI Workplan is included as Figure 1. S-K completed the field activities in August 1994. Activities completed during this reporting period are:

1. Quality Assurance Evaluation. During this reporting period final QA/QC documentation was received from the laboratory, and the data were evaluated per the criteria established in the Quality Assurance Project Plan (QuAPjP).

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2. Investigative Data Evaluation. Final laboratory data reports were received during the reporting period. The investigative data were evaluated relative to the objectives of the Phase I investigation.

3. Phase I Report. Preparation of a draft Phase I Report was completed during the quarter. As of the end of the reporting period, final review of the Phase I Report had not been completed. Final review was completed during January 1995. The Phase I Report is being submitted along with this quarterly report.

S-K estimates that the Phase I RFI was approximately 95-percent complete at the end of the reporting period.

Summary of Activities Completed During this Reporting Period

Evaluation of the investigative and quality assurance/quality control (QA/QC) analytical data was the primary activity completed during this reporting period. A summary of this evaluation is presented below:

- The data were analyzed for the QA/QC criteria established in the QuAPjP. The data were found to be 98.3% complete, satisfying the objective specified in the QuAPjP (>95%). The results of the quality assurance evaluation are presented in the Phase I Report.

- Ethylbenzene was detected (0.005 mg/kg) in one of the investigative samples (RFI-1[2-4']) at a low concentration, equivalent to the laboratory analytical reporting limit. Ethylbenzene was not detected in the field duplicate of this sample. Low levels of di-n-butyl-phthalate (0.84-7.40 mg/kg) were detected in ten of the twenty investigative samples. The presence of di-n-butyl-phthalate is attributed to the use of new brass rings for collection of the soil samples (The new brass rings were factory-wrapped with shrink wrap plastic which likely contains phthalates). The di-n-butyl-phthalate is not considered to indicate the presence of facility related impacts to soils beneath the Pekin site. All investigative data are presented and evaluated in the Phase I Report.

Summary of Changes to RFI Workplan Implementation

Investigation activities were conducted in accordance with the RFI Workplan and conditions contained in the June 21, 1994, RFI approval letter. S-K is not aware of any changes made in the implementation of the RFI Workplan during this reporting period.

Summary of All Problems Encountered During this Reporting Period and Action Taken

S-K is not aware of any problems encountered during this reporting period. Laboratory data satisfied the criteria established in the QuAPjP for completeness. The project is on schedule and S-K anticipates that the Phase I Report is being submitted along with this quarterly report on or before February 1, 1995.

Work Planned for Next Reporting Period

The following tasks of the Phase I RFI will be performed during the next reporting period (January 1 to March 31, 1995).

- Phase I Report. The Phase I Report is being submitted on or by February 1, 1995 (on schedule).

- Quarterly Report. Condition 15 of the IEPA letter dated June 21, 1994 specifies that quarterly reports will be submitted until the final Phase I RFI Report is submitted. The final Phase I RFI Report is being submitted with this quarterly report. Therefore, S-K does not anticipate the submittal of additional quarterly reports.

If you have any questions concerning this progress report, or the RFI activities, please feel free to contact me at (708) 468-2233.

Sincerely,
SAFETY-KLEEN CORP.

For Robert A. Schoepke
Senior Project Manager - Remediation

RAS:CD:ahj/44-01

Attachment

cc: Gary Long, S-K
Jennifer Jendras, S-K (w/o attachment)
Dan Patzschke, S-K
TriHydro Corporation
5-136-01, 999#1780

Safety-Kleen Corporation
Pekin
RFI Phase I Certification Statement
Log No. B-96

Upon completion of Phase I of the RFI, this statement is to be completed by both a responsible officer of the owner or operator (as defined in 35 IAC 702.126) and by the registered professional engineer overseeing all work associated with the investigation. Submit one copy of the certification with original signatures and three additional copies.

RFI Phase I activities at the facility described in the RFI Phase I Workplan have been completed in accordance with the specifications in the <u>approved</u> RFI Workplan. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

ILD093862811
USEPA ID Number

Safety Kleen Corp. Pekin Service Center
Facility Name

Robert A. Schoepke 1/25/95
Signature of Owner/Operator Date

ROBERT A. SCHOEPKE SR. PROJ. MGR - REMEDIATION
Name and Title

1/24/95
Signature of Registered P.E. Date

Jack B. Bedessem 062-049091
Name of Registered P.E. and Illinois Registration Number

Mailing Address of P.E.:

Tri Hydro Corporation
920 Sheridan
Laramie, WY 82070

Registered P.E.'s Seal:

JACK B. BEDESSEM
REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

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Laboratory Certification Statement
Phase I of the RCRA Facility Investigation
Safety-Kleen Corporation
Pekin
Log No. B-96

Upon completion of Phase I of the RFI, this statement is to be completed by both a responsible officer of the owner or operator (as defined in 35 IAC 702.126) and (2) a responsible officer (as defined in 35 IAC 702.126) of the laboratory which conducted the chemical analyses required as part of Phase I of the RFI. The original of this statement shall accompany the original certification statement for the overall Phase I activities and the RFI Phase I Report.

The sample collection, handling, preservation, preparation and analysis conducted as part of Phase I of the RFI at the facility described in this document has been conducted in accordance with the specifications in the approved workplan. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

ILD 093862811
USEPA ID Number

Safety-Kleen Corp. Pekin Service Center
Facility Name

Robert A. Schoepke 1/25/95
Signature of Owner/Operator Date

ROBERT A. SCHOEPKE
SR. PROJECT MANAGER - REMEDIATION
Name and Title of Owner/Operator Representative

Allan A Manteuffel Technical Center
Name of Laboratory

James L. Breece 1/24/95
Signature of Laboratory Responsible Officer Date

JAMES L. BREECE, Ph.D.
Name and Title of Laboratory Responsible Officer
V.P. Technical

Mailing Address of Laboratory:
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P.O. Box 92050
Elk Grove Village, Il
60009-2050

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CHAPTER I

INTRODUCTION

Safety-Kleen Corp. (S-K) owns and operates a service center in Pekin, Illinois. The location of the center is shown on Figure I-1. The Pekin Service Center is used to collect and temporarily store spent mineral spirits, immersion cleaner, dry cleaner solvent, paint wastes and waste oil until the materials are shipped to a S-K recycle center for reclamation into products and fuels.

S-K conducted Phase I of the RCRA Facility Investigation (RFI) at the service center in August 1994. The RFI was conducted in accordance with the "RCRA Facility Investigation Phase I Release Assessment Workplan" dated March 3, 1994. The Illinois Environmental Protection Agency (IEPA) approved the RFI Workplan with conditions in a letter dated June 12, 1994.

RFI Objective

The Pekin Service Center is permitted to maintain and operate a waste management facility involved in the storage of RCRA hazardous wastes (ILD 093862811). As a condition of the RCRA permit issued by the Illinois Environmental Protection Agency (IEPA), S-K is required to conduct a RCRA Facility Investigation (RFI). The purpose of the RFI is to determine if hazardous wastes and/or hazardous constituents have been released or have the potential to be released from certain solid waste management units (SWMUs) or areas of concern (AOC) at the facility.

In order to achieve the RFI objective, IEPA designed a three-phase process and incorporated it into the Part B Permit:

- Phase I - Release Assessment - Phase I is designed to provide information on the characteristics and integrity of each SWMU/AOC and to determine if a SWMU/AOC has released, is currently releasing, or has the potential to release hazardous waste and/or hazardous constituents to the soil or air.

- Phase II - Extent of Release Assessment - Phase II is designed to define the extent of releases (if any) to soil from the subject SWMUs/AOC.

- Phase III - Ground-Water Release Assessment - Phase III is designed to define the extent of releases to the ground water (if any) from SWMUs/AOC identified in Phase I or II to have potentially released hazardous waste or hazardous constituents to the ground water.

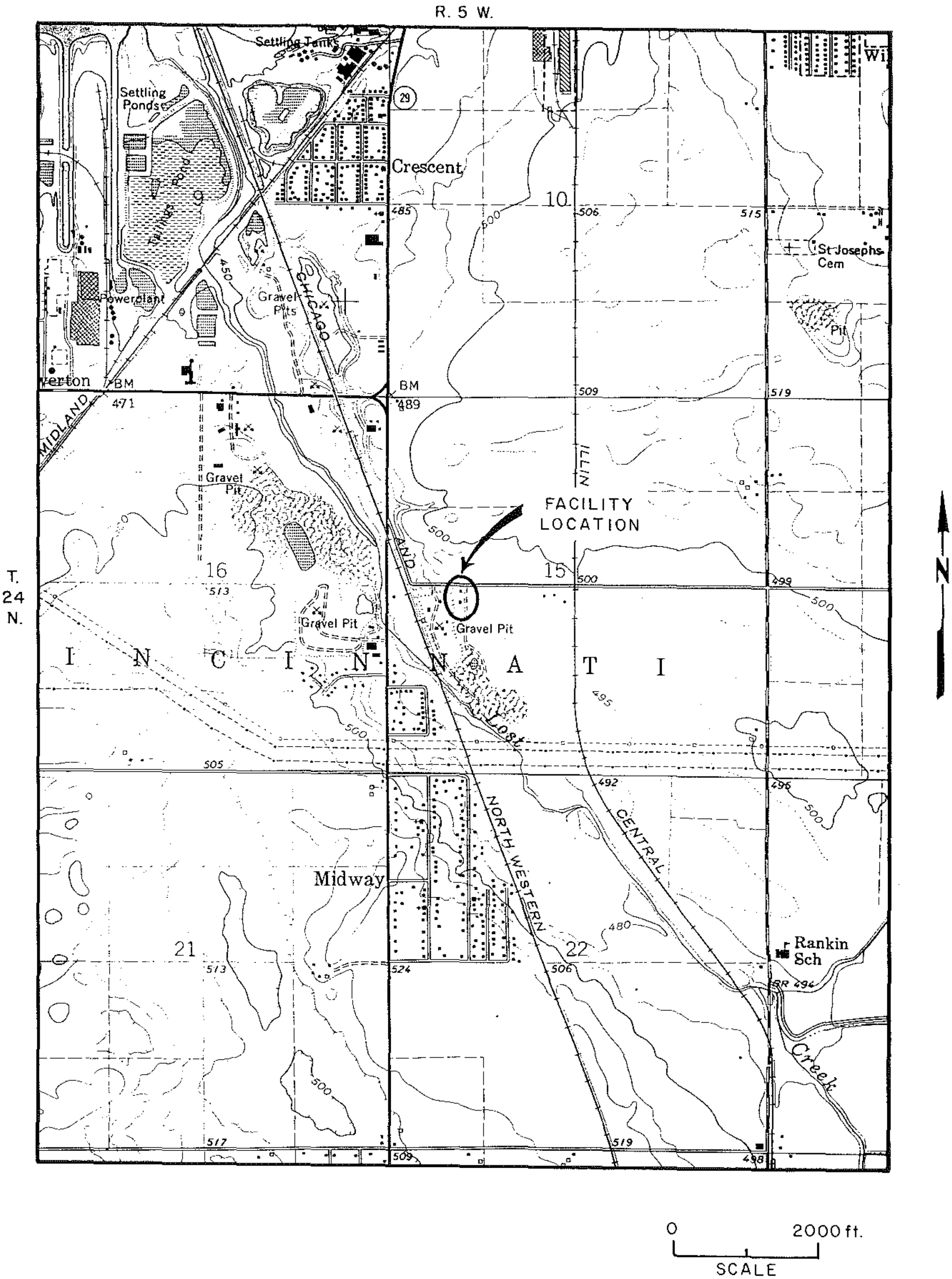

FIGURE I-I : FACILITY LOCATION MAP, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

S-K believes that the purpose of the RFI has been achieved with the results from the Phase I release assessment, and that additional assessment work is unnecessary.

Solid Waste Management Units

The Part B Permit for the Pekin Service Center lists three solid waste management units (SWMUs) or areas of concern (AOCs) to be addressed during the Phase I Release Assessment:

- SWMU #13 - Warehouse Area Trench
- SWMU #14 - Warehouse Drain
- AOC #16 - Past Oil Spill Area

Locations of the two SWMUs and the AOC are shown on Figure I-2. The SWMUs and AOC are described below.

SWMU #13 - Warehouse Area Trench

Prior to S-K's ownership of the property, the warehouse was used by Shallonburger Excavating as a garage for four to five work trucks. The warehouse is currently used by S-K for dry goods, product, and general storage. The southern end of the warehouse is a permitted Hazardous Waste Management Unit (HWMU) for storage of containerized waste, including dry cleaning solvents, immersion cleaner waste, spent antifreeze, and dumpster sediment.

The container storage area has a secondary containment trench with dimensions 22 feet long, 3 feet wide, and 3.8 feet deep. The secondary containment trench has a capacity of 1,860 gallons.

An assessment of the container storage area, which contains the secondary containment trench, was conducted by Harding Lawson Associates in December 1991. This assessment indicated that the trench had small cracks in two locations. To correct this condition, the inside of the cinder blocks were pressure grouted to seal the trench, and the trench was coated with a trichloroethylene/perchloroethylene resistant polymer coating. A subsequent assessment of the container storage area, including the secondary containment trench, was conducted by Harding Lawson Associates in September 1992. This assessment determined that the container storage area was structurally intact, and met applicable requirements of Illinois Administrative Code for containerized waste storage. No releases have occurred to the container storage area trench according to S-K records.

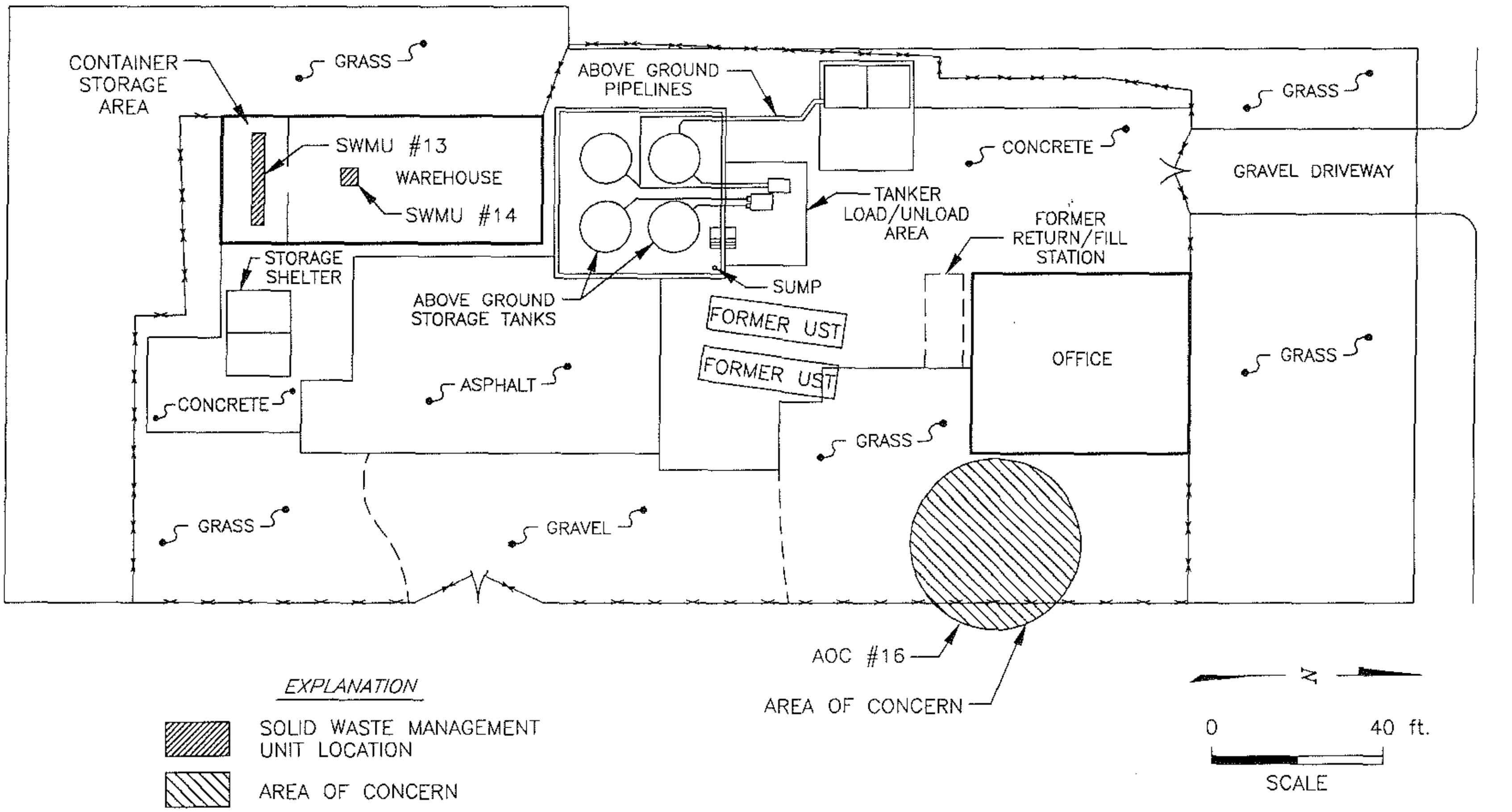

FIGURE 1–2 :LOCATION MAP, AREAS OF INVESTIGATION, RFI PHASE I RELEASE ASSESSMENT, SAFETY–KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

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SWMU #14 - Warehouse Drain

The SWMU #14, referred to as a warehouse drain in the Part B permit, was located in the warehouse, north of the container storage area. This area has never been used by S-K for hazardous waste management. The SWMU was actually a sump 4 feet 2 inches square and had a concrete floor, with a sump pump in the bottom to evacuate any fluid accumulation. Per Roger Brotherton, the former Pekin Service Center Branch Manager, the sump had block walls, a chemical resistant coating, and was sealed with concrete in approximately 1991. According to S-K records, no releases have occurred to the warehouse sump, according to S-K records.

AOC #16 - Past Oil Spill Area

On February 21, 1989, a spill of approximately 1,000 gallons of a waste oil/water mixture occurred from a truck tanker. This spill covered an area approximately 40 feet by 40 feet, and was located approximately 50 feet east of the former underground storage tanks outside the fence and along the fenceline. Available information indicates that the spill occurred onto soil. Peoria Disposal Company (PDC) excavated 129 cubic yards of visually stained soil and disposed of the soil at the Clinton Landfill.

CHAPTER II

INVESTIGATIVE PROCEDURES

Soil sampling and analysis was conducted according to the procedures described in Section IV of the RFI Workplan and modified by the IEPA Workplan approval letter. These procedures are summarized below, along with the minor changes in sampling locations to accommodate site conditions. Photodocumentation of soil sampling procedures is provided in Appendix A. Copies of the field notes are presented in Appendix B.

Soil Sampling Locations

Background and SWMU/AOC sampling locations are shown on Figure II-1. Soil sampling locations were selected to provide the best evaluation of worst-case conditions caused by a release of hazardous wastes or hazardous constituents from the designated SWMUs and AOC.

Soils not influenced by releases from SWMUs/AOC and other industrial activities will naturally contain certain hazardous constituents such as metals. Data from background locations can be critical to identify the presence of elevated concentrations of metals (and perhaps other constituents) in soils due to a release. The four background sampling locations are shown on Figure II-1. The four background locations satisfy the following criteria:

1. Located on Pekin facility property to minimize uncertainties about prior uses in the background areas.

2. Located at least 50 feet from any SWMUs/AOC listed in the Part B Permit and located outside areas of operation.

3. Same soil texture as encountered in SWMU/AOC soil samples (natural metals concentrations are a function, in part, of soil texture).

Ten soil sampling locations were located in the SWMU/AOC areas, as shown on Figure II-1. Per the RFI Workplan, two sampling locations were adjacent to the warehouse area drain (SWMU #14) inside the warehouse. In the investigation of the trench in the warehouse (SWMU #13), four borings were constructed adjacent to the secondary containment trench instead of three borings in the trench, as proposed in the RFI Workplan. The reason for this change was to avoid drilling within the secondary containment trench for an operating drum storage area. This modification was approved by IEPA (Messrs. Gregg Sanders and Ron Mehalic) during their field visit.

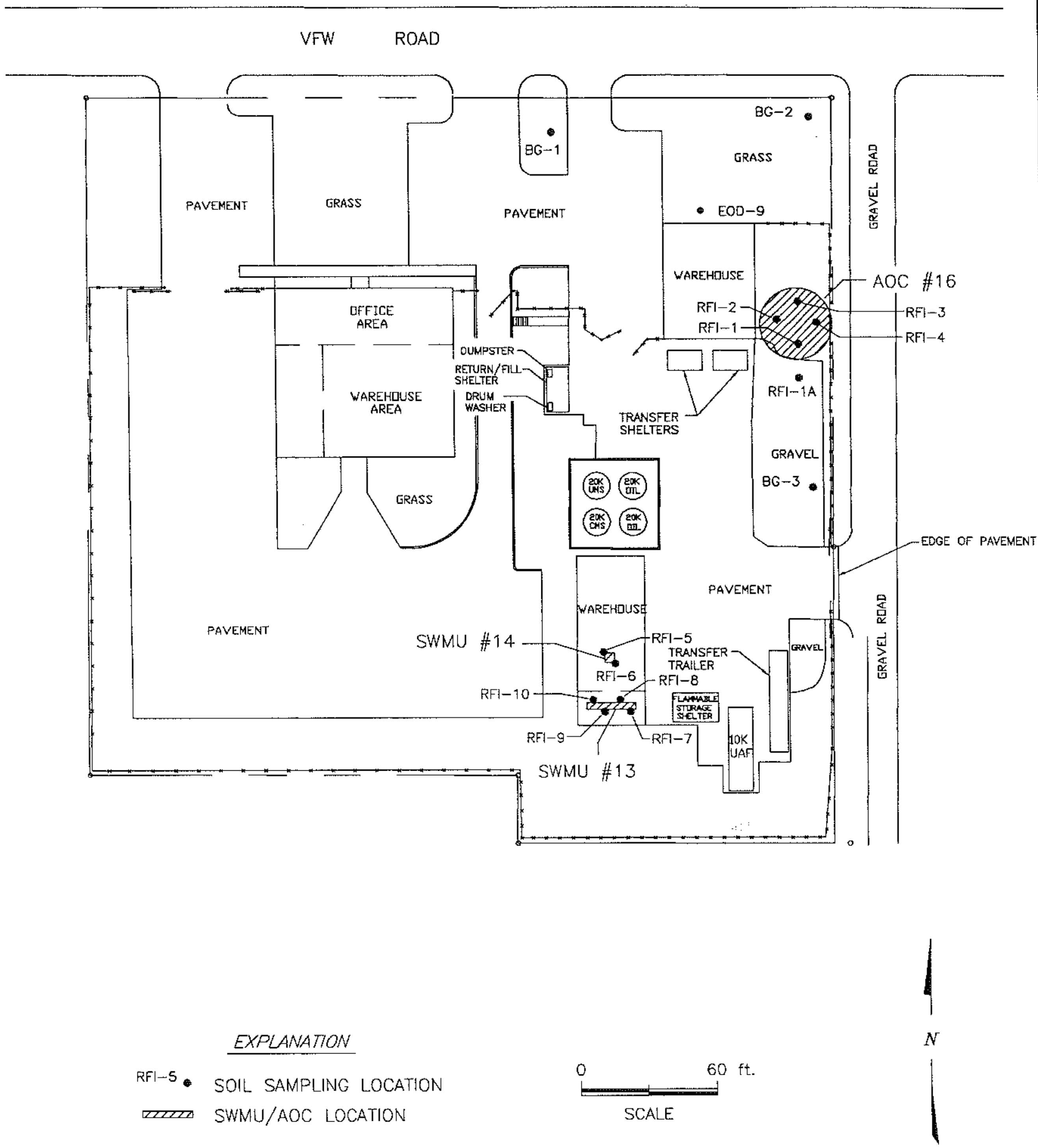

FIGURE II-1 :SOIL SAMPLING LOCATIONS, RFI PHASE I RELEASE ASSESSMENT, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

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Per the RFI Workplan, four locations were sampled in the area of the past oil spill (AOC #16). A fifth borehole (RFI-1A) was completed south of AOC #16 in order to determine the lateral extent of fill material in the shallow subsurface.

Soil Sampling Depths

Soil sampling occurred in the unsaturated zone during the Phase I Release Assessment, in order to identify releases from Pekin facility SWMUs/AOC. Groundwater levels were approximately 35 feet below ground surface during the RFI.

At the background locations, soil samples were collected continuously to 15 feet at two locations and to ground water (approximately 35 feet below ground surface) at two other locations. All soil samples were screened in the field for impacts according to methods described in a later section of this chapter. Background samples were sent to the laboratory for chemical analysis from depth intervals similar to sampled intervals at the SWMU/AOC locations.

At the SWMU/AOC locations, soil samples were collected continuously to between 6 and 10 feet. All soil samples were screened in the field for impacts according to methods described in a later section of this chapter. Samples were sent to the laboratory for chemical analysis in accordance with the RFI Workplan and conditions 9b and 10b of the IEPA approval letter.

Sample Collection Procedures

The project site manager implemented the monitoring required under the Health and Safety Plan (Part V of the RFI Workplan). Concrete or asphalt was removed (where present), and soil sample collection commenced with GeoProbe-equivalent equipment using the following procedure:

1. A new or decontaminated brass liner was placed into a stainless steel sampler (called a Kansas sampler). Samplers are 1 or 2 feet in length.

2. The sampler (decontaminated) was attached to drive rods which are 3 feet in length.

3. The sampling tool was hydraulically advanced to the sampling depth.

4. The tool was opened and driven 1 to 2 feet to fill the liner with a soil sample.

5. The tool was hydraulically withdrawn to the surface.

6. The brass liner was broken manually into three sections by a field team member wearing new, clean, latex gloves.

7. The uppermost section was discarded, because it may have contained borehole slough.

8. Two sections were capped with Teflon sheets and slip-on plastic caps, marked with a sample number, and placed in an opaque cooler on ice immediately upon collection. Care was taken to minimize headspace during this procedure. Sample collection adhered to IEPA "Soil Volatile Sampling Procedures" (Appendix IV-A of the RFI Workplan), except that Teflon sheeting rather than aluminum foil was used to seal the brass liners.

8. The soil in the remaining section was subjected to field screening procedures described in a subsequent section.

One soil sample, consisting of two brass rings and one 4-ounce glass jar, was collected from each sampling interval. In addition, blind duplicate samples were collected from two of the SWMU/AOC sites for quality assurance analyses. The brass rings were used for analysis of volatile organic compounds, semi-volatile organic compounds, and total petroleum hydrocarbons as mineral spirits. The sample aliquot in the glass jar was used for analysis of eight TCLP metals.

Two brass rings from selected intervals were immediately stored on ice for transport to the laboratory. No preservatives were added to the soil sample containers. Coolers were shipped to the laboratory within 24 hours of sample collection.

Soil was containerized in 55-gallon DOT drums and handled through the S-K waste management program. Sampling locations were plugged by pouring bentonite granules down the hole and hydrating in approximately 1- to 2-foot lifts to the surface. The surface was repaired to matching grade. A concrete patch was placed over the sampling location in areas where concrete is present and asphalt patch was placed over the sampling location in areas where asphalt is present.

Field Screening

One aliquot of soil from each sampling interval was screened in the field to evaluate the nature and degree of impact. Field screening included physical descriptions, measurement of total organic vapors (TOV) with the photoionization detector, and measurement of total recoverable petroleum hydrocarbons (TRPH) with a TRPH analyzer at the former oil spill area (AOC #16) only.

One subaliquot of soil from each sampling depth was extracted from the brass liner into a ziploc bag and allowed to equilibrate to room temperature. The PID probe was inserted into the bag, and the highest TOV reading measured by the PID was recorded in the field book. A Thermo Environmental Model 580B PID equipped with a 10.0 eV lamp was used during field screening. The PID was calibrated with a 100 parts per million (ppm) isobutylene standard at the beginning of each day and periodically during the day. The soil was described by the onsite geologist in terms of texture, moisture content, staining, odor, and any other pertinent information.

TRPH analysis were conducted on samples collected in the vicinity of the past oil spill (AOC #16). The standard operating procedure for the TRPH analysis is included in Appendix IV-D of the RFI Workplan.

Samples from each interval were held in a cooler or refrigerated at the site until it was determined which samples would be sent to the laboratory based on field screening. The laboratory samples were packaged, placed on ice in a cooler (maintained at 4°C), and delivered within 24 hours of sampling to the S-K Environmental Laboratory for analysis. Soil samples were not composited. All samples were accompanied by completed chain-of-custody/sample-analysis-request forms Appendix C.

Decontamination Procedures

Brass rings arrived cleaned and wrapped in plastic from the manufacturer. Some brass rings were decontaminated and re-used during the RFI. Field decontamination included washing the sampling devices and brass rings and caps in a warm non-phosphate detergent solution, rinsing the devices and containers with tap water, and then rinsing the devices with distilled or deionized water. Sampling devices and containers were dried before use by air drying or with clean paper towels. The decontaminated sampling devices and brass rings were stored in clean plastic bags until use. All washing fluids and rinse water were handled in accordance with applicable regulations through the S-K waste management program.

Field Documentation

Field observations during soil sampling were recorded in the field notebook. The following information was recorded in the field notebook where appropriate:

- Date and name of observer
- Names and affiliations of sampling team members
- Names and affiliations of others present at the sampling sites
- Weather conditions

- Sampling location and time of sampling
- Health and safety data on total organic vapors, etc.
- Health and safety measures implemented (e.g., respirators)
- Sampling site condition upon arrival (concrete cover, standing water, erosion, etc.)
- Soil characteristics and texture
- Soil observations, including discoloration, hydrocarbon sheens, moisture content, etc.
- Deviations from or clarifications of sampling procedures in the Workplan.
- Miscellaneous conditions which the sampling team found noteworthy.

The project site manager reviewed and signed the field notes after each day of sampling. Copies of the field notes are included in Appendix B.

Laboratory Analysis

Samples were submitted to S-K Environmental Laboratory for chemical analysis. The laboratory is located in Elk Grove Village, Illinois. Eight background samples (four per soil texture) and 20 investigative samples were submitted to the laboratory for chemical analysis. Two additional samples were submitted in duplicate for quality assurance.

The samples were analyzed for the 107 constituents described in Table II-1. The full constituent list is presented in the laboratory reports in Appendix C. The constituent list consists of eight metals, 37 volatile organic compounds (VOCs), and 62 semi-volatile organic compounds (SVOCs). The constituent list includes:

- All hazardous constituents detected in soils during previous sampling events at the Pekin facility.
- All hazardous constituents and hazardous waste constituents which might cause some wastes managed at the Pekin facility to be listed or characteristic hazardous wastes.
- Other VOCs and SVOCs commonly analyzed by the S-K Environmental Laboratory using Methods 8240 and 8270 (gas chromatography/mass spectroscopy), respectively.

Table II-1. Constituent List, RFI Phase I Release Assessment, Safety-Kleen Corp., Service Center, Pekin, Illinois.

Constituent	Method (from SW-846)
<u>Inorganics</u>[1]	
Arsenic	7060
Barium	6010
Cadmium	7131
Chromium	6010
Lead	7421
Mercury	7470
Selenium	7740
Silver	7761
<u>Organics</u>	
Volatile Organic Compounds (37)	8240[2]
Semi-Volatile Organic Compounds (62)	8270[2]

[1] TCLP extract analyzed for metals in accordance with Condition 9e of June 21, 1994, IEPA letter.

[2] All constituents listed in the RFI Workplan were analyzed and reported.

All organic analyses were conducted for the total concentration of each constituent. Inorganic analyses were conducted for the TCLP extract in accordance with Condition 9e of the IEPA approval letter. Analytical methods are referenced in Table II-1, and contained in EPA's SW-846.

Quality Assurance Procedures

Background soil samples, blind duplicate soil samples, and laboratory-prepared quality assurance samples were analyzed by the laboratory during the Phase I Release Assessment to evaluate quality control. The quality assurance results are described in detail in Appendix D.

CHAPTER III

INVESTIGATION RESULTS

Safety-Kleen Corp. (S-K) conducted the Phase I RCRA Facility Investigation at its Pekin Service Center in August 1994. Soil sampling was conducted on August 10 and 11, 1994. Laboratory analysis of the soil samples were performed in August and September 1994. The results of the investigation are discussed below.

Lithology

Soil samples were collected at four background locations and ten locations in the vicinity of two solid waste management units (SWMUs) and one area of concern (AOC). The soil sampling locations are shown on Figure III-1.

The geologist onsite during the investigation logged the boreholes from soil samples collected in brass rings continuously from ground surface to total depth of the borehole. The borehole logs are included in Appendix E.

A lithologic cross-section was prepared through the eastern part of the facility which contains the two SWMUs and one AOC. The location of the cross-section is shown on Figure III-1. The cross-section itself is presented on Figure III-2. As shown on the cross-section, the site slopes gently to the south.

The lithology is consistent across the site. The upper 3 to 5 feet consist of a reddish brown silty loam. Below the silty loam to about 10 feet is a dark red, fine- to medium-grained sand. Below that layer is a tan, medium- to coarse-grained sand with minor amounts of sandy gravel or silt in some intervals. Ground water was encountered about 35 feet below ground surface.

Field Screening Results

Total organic vapors (TOV) were measured on soils collected from every interval at the four background and ten SWMU/AOC locations. Total recoverable petroleum hydrocarbons (TRPH) were measured on soils collected at the former oil spill area (AOC #16).

The TOV and TRPH field screening results are shown on Figure III-3 for the former oil spill area and on Figure III-4 for the warehouse trench and drain. All TOV and TRPH concentrations were below background. The TOV background concentrations were established by measuring TOV in a clean ziploc bag which contained no

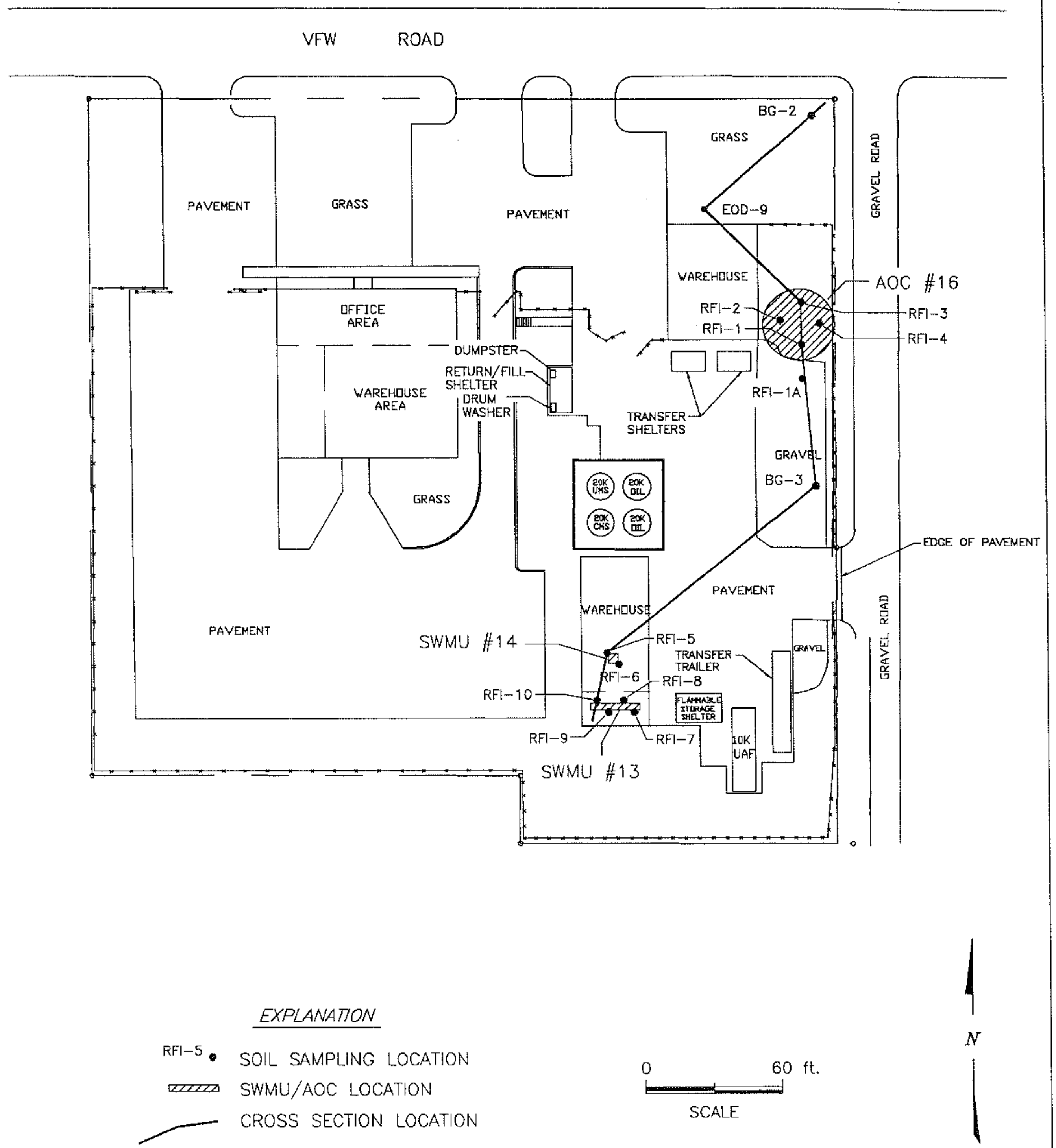

FIGURE III-1 :CROSS SECTION LOCATION, RFI PHASE I RELEASE ASSESSMENT, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

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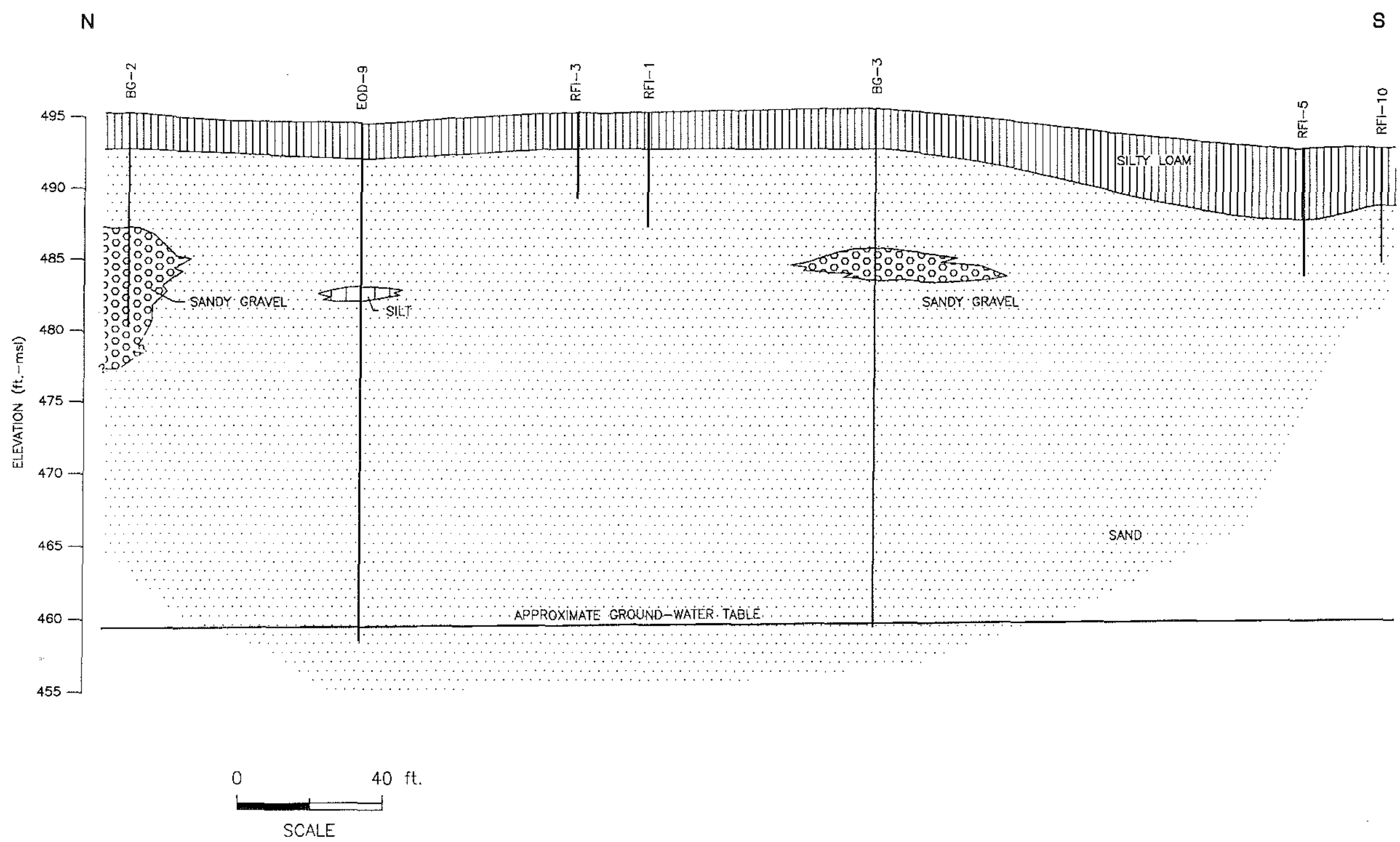

FIGURE III-2 :CROSS SECTION, RFI PHASE I RELEASE ASSESSMENT, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

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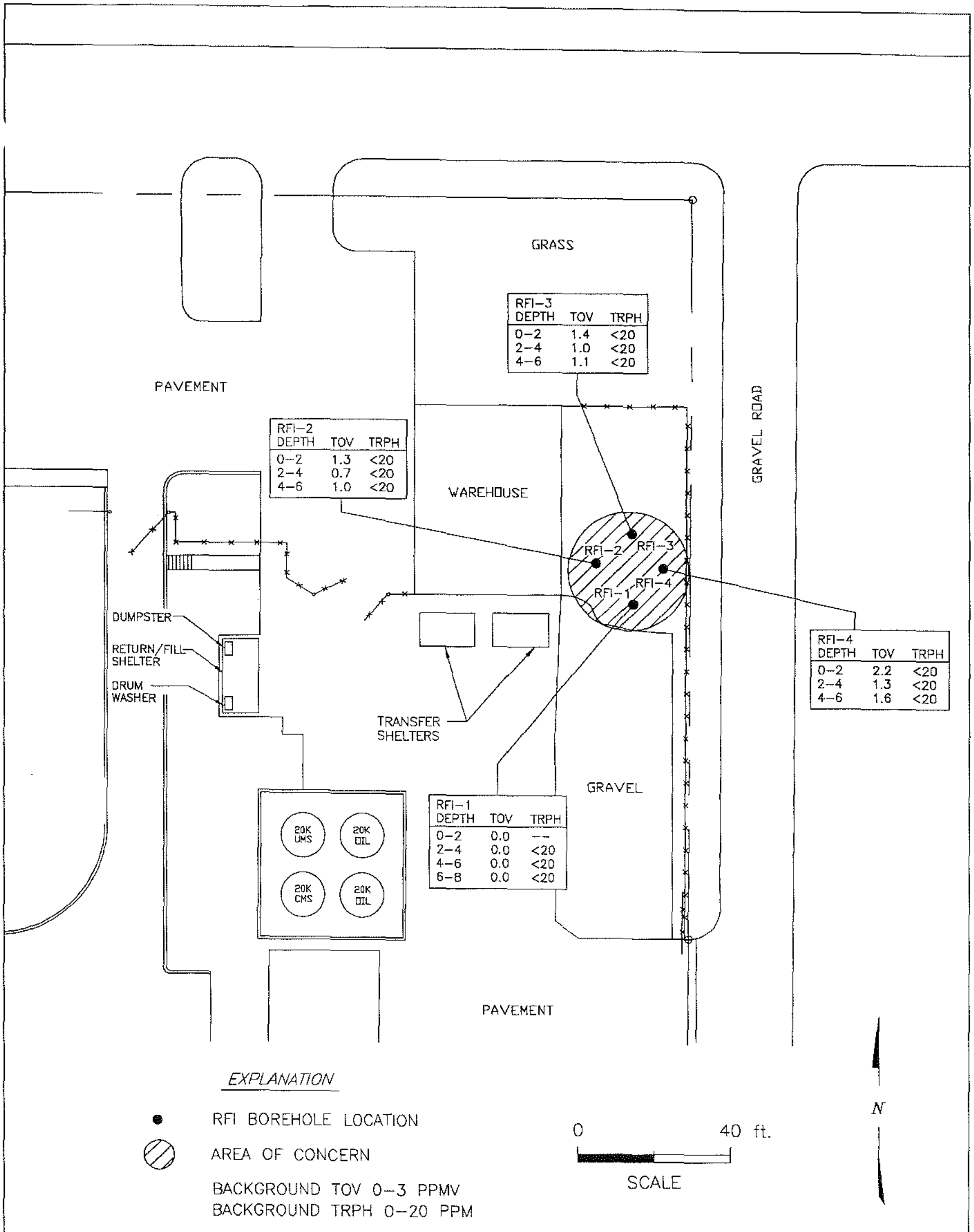

FIGURE III-3 :FIELD SCREENING DATA, PAST OIL SPILL (AOC #16), PHASE I RELEASE ASSESSMENT, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

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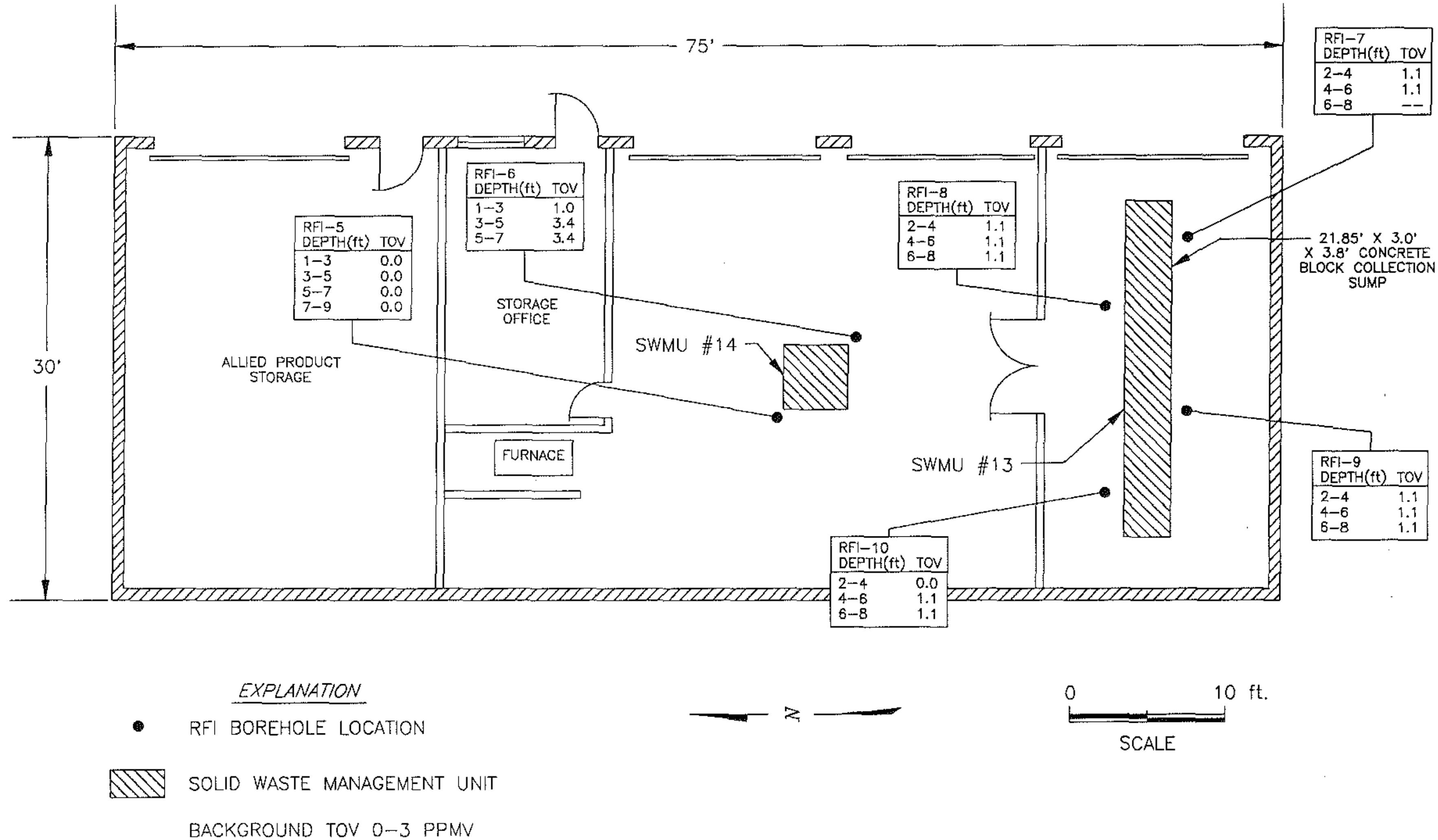

FIGURE III-4 :FIELD SCREENING DATA, WAREHOUSE AREA TRENCH (SWMU #13) AND DRAIN (SWMU #14), PHASE I RELEASE ASSESSMENT, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

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soils; background TOV concentrations ranged up to 3 parts per million as isobutylene. The TRPH background concentrations were established by the baseline drift in the instrument when measuring TRPH on soils from the background locations; the typical TRPH instrument drift is up to 20 parts per million.

Laboratory Results

The laboratory data reports are included in Appendix C. The raw data sheets and chromatograms are available upon request. The laboratory results are summarized in Table III-1. A few of the data have been qualified (reference the Quality Assurance Project Report in Appendix D). However, the qualifications do not affect the utility of the results in achieving the objectives of Phase I.

All concentrations of TCLP metals and total petroleum hydrocarbons (TPH) as mineral spirits were below detection limits. Concentrations of volatile organic compounds (VOCs) were also below detection limits, except for one concentration of ethylbenzene measured at the detection limit (0.005 mg/kg) in a soil sample [RFI(2-4)] collected at the former oil spill area (AOC #16). The ethylbenzene concentrations were below the detection limit in a duplicate sample [RFI(2-4)(dupe)] as well as in the other seven soil samples collected in the former oil spill area (AOC #16), including the one [RFI(4-6)] collected immediately below RFI(2-4).

All concentrations of semi-volatile organic compounds (SVOCs) were below detection limits, except for those of di-n-butyl phthalate in eleven of the first twelve samples collected for SVOC analysis during the RFI. Samples in which di-n-butyl phthalate was detected correspond to samples collected in brass rings wrapped in black plastic sleeves by the manufacturer. A picture of the black plastic sleeve is presented in Appendix A. It is believed that the heat-wrapping process used by the manufacturer caused di-n-butyl phthalate, which is a common plasticizer, to volatilize and coat the inside of the brass ring, and thus contaminate the soil samples. Brass rings which were decontaminated according to the procedures described in Chapter II and re-used during the investigation were not associated with samples containing di-n-butyl phthalate. A more detailed discussion of the di-n-butyl phthalate situation is presented in the Quality Assurance Project Report (Appendix D). S-K believes that the detection of di-n-butyl phthalate is related to sampling and/or analytical artifacts and not site conditions.

Conclusions

The objective of Phase I is to detect any releases of hazardous constituents from the two SWMUs and one AOC. The field screening and laboratory data document that releases are not present at the SWMUs and AOC. The one VOC detection (ethylbenzene at the detection limit of 0.005 mg/kg) was not confirmed by

Table III-1. Soil Quality Data, RFI Phase I Release Assessment, Safety-Kleen Corp. Service Center, Pekin, Illinois.

Location and Depth (in feet)	TCLP Metals (mg/L)	Total Petroleum Hydrocarbons (mg/kg as mineral spirits)	Volatile Organic Compounds		Semi-Volatile Organic Compounds	
			Ethylbenzene (mg/kg)	All Others (36) (mg/kg)	Di-n-butyl Phthalate (mg/kg)	All Others (61) (mg/kg)
Background Locations						
BG-1						
0.5-2.5	All ND	--	--	--	--	--
13-15	All ND	--	--	--	--	--
BG-2						
0.5-2.5	All ND	--	--	--	--	--
8-10	All ND	--	--	--	--	--
BG-3						
2-4	All ND	--	--	--	--	--
18-20	All ND	--	--	--	--	--
EOD-9						
0.5-2.5	All ND	--	--	--	--	--
5-7	All ND	--	--	--	--	--
Past Oil Spill Area (AOC #16)						
RFI-1						
2-4	All ND	--	0.005	All ND	2.90	All ND
2-4 [1]	All ND	--	ND(0.005)*	All ND	7.40	All ND
4-6	All ND	--	ND(0.005)	All ND	2.40	All ND
RFI-2						
0-2	All ND	--	ND(0.005)	All ND	0.84	All ND
2-4	All ND	--	ND(0.005)	All ND	2.70	All ND
RFI-3						
0-2	All ND	--	ND(0.005)	All ND	0.73	All ND
2-4	All ND	--	ND(0.005)	All ND	2.80	All ND
RFI-4						
0-2	All ND	--	ND(0.005)	All ND	1.30	All ND
2-4	All ND	--	ND(0.005)	All ND	4.80	All ND
Warehouse Drain (SWMU #14)						
RFI-5						
3-5	All ND	ND(50)	ND(0.005)	All ND	ND(0.66)	All ND*
5-7	All ND	ND(50)	ND(0.005)	All ND	3.30	All ND*
RFI-6						
3-5	All ND	ND(50)	ND(0.005)	All ND	3.70	All ND
5-7	All ND	ND(50)	ND(0.005)	All ND	ND(0.66)	All ND*
Warehouse Area Trench (SWMU #13)						
RFI-7						
4-6	All ND	ND(50)	ND(0.005)	All ND	ND(0.66)	All ND
6-8	All ND	ND(50)	ND(0.005)	All ND	ND(0.66)	All ND
RFI-8						
4-6	All ND	ND(50)	ND(0.005)	All ND	ND(0.66)	All ND
6-8	All ND	ND(50)	ND(0.005)	All ND	ND(0.66)	All ND

44-01\8T-3-1.XLS

Table III-1. Soil Quality Data, RFI Phase I Release Assessment, Safety-Kleen Corp. Service Center, Pekin, Illinois.

Location and Depth (in feet)	TCLP Metals (mg/L)	Total Petroleum Hydrocarbons (mg/kg as mineral spirits)	Volatile Organic Compounds		Semi-Volatile Organic Compounds	
			Ethylbenzene (mg/kg)	All Others (36) (mg/kg)	Di-n-butyl Phthalate (mg/kg)	All Others (61) (mg/kg)
RFI-9						
4-6	All ND	ND(50)	ND(0.005)	All ND	ND(0.66)	All ND
6-8	All ND	ND(50)	ND(0.005)	All ND	ND(0.66)	All ND
6-8 [2]	All ND	ND(50)	ND(0.005)	All ND	ND(0.66)	All ND
RFI-10						
4-6	All ND	ND(50)	ND(0.005)	All ND	ND(0.66)	All ND
6-8	All ND	ND(50)	ND(0.005)	All ND	ND(0.66)	All ND

Note:

[1] The blind duplicate of RFI-1(2-4) is listed as RFI-20(6-8) on the laboratory data sheets in Appendix C.

[2] The blind duplicate of RFI-9(6-8) is listed as RFI-21(10-12) on the laboratory data sheets in Appendix C.

* Qualified data. Reference Appendix D.

44-01\BT-3-1.XLS

data from the duplicate sample or other samples from the same AOC. The detections of di-n-butyl phthalate in eleven samples are related to sample contamination by the plastic sleeves on the brass rings or low levels of laboratory contamination. Because of the absence of any releases, the objectives of Phase I and the entire RCRA Facility Investigation have been met. Therefore, additional investigations or corrective actions at the two SWMUs and one AOC at the Pekin Service Center are not warranted.

APPENDIX A

PHOTODOCUMENTATION
RFI PHASE I RELEASE ASSESSMENT
PEKIN SERVICE CENTER

APPENDIX A

PHOTODOCUMENTATION
RCRA FACILITY INVESTIGATION
SAFETY-KLEEN CORP. SERVICE CENTER
PEKIN, ILLINOIS

Photo	Description
1	Extracting soil sample at Borehole RFI-1, AOC #16.
2	View northeast showing sampling at Borehole RFI-1, AOC #16. Orange paint mark at center-left edge of photo is Borehole RFI-2.
3	View west showing pre-drilling concrete at Borehole RFI-10, SWMU #13. Borehole RFI-7 immediately outside lower left photo edge; RFI-8 on right (north) side of trench/sump in middle ground; RFI-9 on left (south) side of trench/sump in background.
4	View west showing drilling and sampling at Borehole RFI-9, SWMU #13.
5	View southwest showing drilling and sampling at Borehole RFI-5, SWMU #14. Concrete-filled sump (SWMU #14) underneath rig and Borehole RFI-6 in front of rig.
6	Preparation of soil samples for volatile organics analysis (applying Teflon sheeting and tight-fitting plastic caps to brass rings).
7	Preparing soil samples for metals analysis (filling glass jars) following field screening sample in plastic bag for TOV with PID.
8	Split samples collected by IEPA during Extent of Degradation (EOD) Investigation. Decontaminated four-ring sets were factory-prepared with black plastic sleeves (as shown) for easy loading into the sampling tubes. Brass rings in plastic sleeves were used to collect samples from boreholes RFI-1 through RFI-6, which were found to contain detectable levels of di-n-butyl phthalate. The presence of di-n-butyl phthalate is attributed to the plastic sleeves (see QAPjP report, Appendix D).

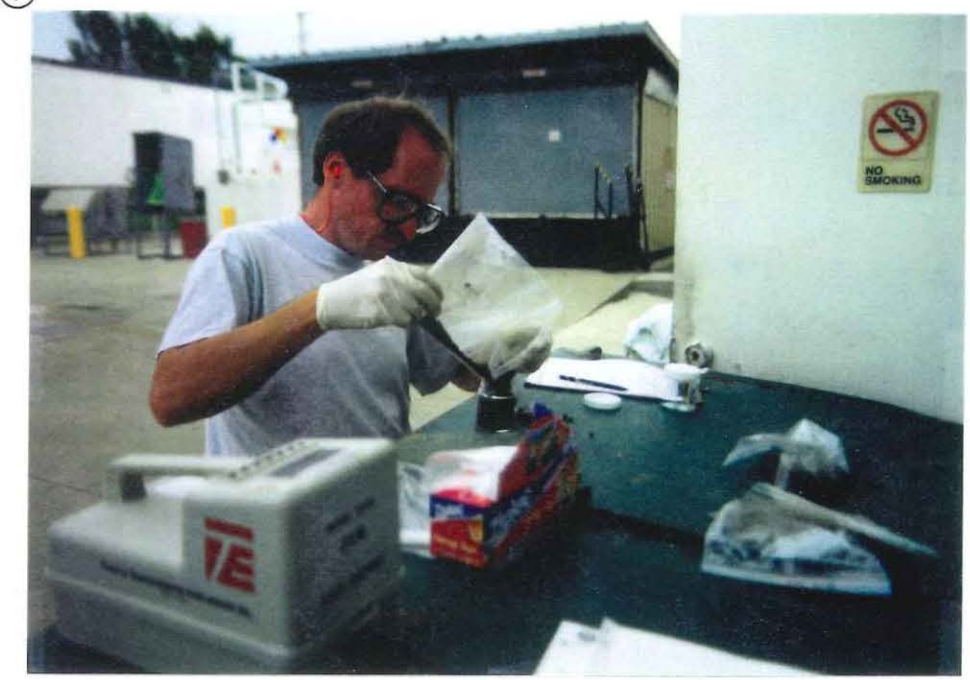
①

②

③

4 6

5 7




Coleman
48
Return to:
IEPA/DLPC
5415 N. University
Peoria, IL. 61614
DLPC

8

APPENDIX B

FIELD NOTES
RFI PHASE I RELEASE ASSESSMENT
PEKIN SERVICE CENTER

page 1

DAILY FIELD MEMORANDUM

Date: 8/10/94

Field Personnel: TOM NISSEN - TRIHYDRO | STEVE GRACE - GEO
CHARLIE DEWOLF - TRIHYDRO
MARK YIATRAS - GEO

Forms Completed as Attachments to this Memorandum*:

FORM 02
FORM 03
FORM 04
FORM 05
FORM 06
FORM 07
BOREHOLE LOGS

* Note: Ensure all forms are signed by field personnel

Activity Log:

Time	Activity	Location
0700-0715	SITE RECON, MEASURE LOCATIONS, AIR MONITORING	AOC #16, RFI-1 - RFI-4
0715-0905	DRILL & SAMPLE RFI-1 thru RFI-4 &	"
	COLLECT DUPLICATE [RFI-20 (6-8)] of RFI-1	"
0905-1300	DRILL & SAMPLE EOD-4 AND EOD-5	FORMER UST AREA
1300-1340	LUNCH	
1340-1410	SITE RECON, SET UP, PRE-DRILL CONCRETE	SWMU #14
1410-1510	DRILLING/SAMPLING RFI-5 & RFI-6	"
1510-1520	RECON, MOVE DRUMS, PREDRILL CONCRETE &	
	MONITOR AIR AT SWMU #13	SWMU #13
1520-1800	DRILLING/SAMPLING RFI-7 thru RFI-10	
1800-1845	Clean up, Leave Site	

Signatures:

Charles P. DeWolf
Thomas C. Nissen

Field Personnel

Thomas C. Nissen

Project Manager

DAILY INSTRUMENT CALIBRATION/MAINTENANCE LOG

Date Aug 10 1994

Field Instrument and Number	Standard and Concentration	Calibration Reading	Accuracy Reading	Accuracy (+/- from Standard)	Calibrators Initials
HAZCO MSA 260	Pentane 50	50	50	–	CD
HAZCO 580B-7381	ISOBUTYLENE 100	101.6	101.6	–	CD
TRIHYDRO 580A #1	ISOBUTYLENE 100	98.5	99	0.5%	CD

Field Instrument and Number	Maintenance Personnel	Maintenance Performed

Used 580A for RFI-1, RFI-2
Used 580B on all others

Thomas C [illegible]
SITE MGR

[illegible signature]

SOIL SAMPLING
HEALTH AND SAFETY WORKSHEET

Date: 8/10/94
Job #: ~~41~~-01 SK PEKIN RFI
Sampling Location: AOC #16
Page: 1 of 1

Onsite Personnel:

Name	Affiliation	PPE (include modifications and times)
CHARLIE DEWOLF	TRIHYDRO	MOD LEVEL D (HARD BOOTS, DISP. GLOVES, SAFETY GLASSES, EAR PROT)
TOM NISSEN	"	
MARK YIATRAS	GEO ENV	
STEVE GRACE	"	

Health and Safety Data:

Time of Measurement	Collection Area	TOV (ppm)	% LEL	pH	Air Temperature	Other (Specify)
0715	AOC #16 @ RFI-1 thru RFI-4	0.0	0	--	68°	

Thomas [signature]
Site Safety Officer

[signature]

Form 04

SOIL SAMPLING
HEALTH AND SAFETY WORKSHEET

Date: AUG 10, 1994
Job #: 44-01 PEKIN REI
Sampling Location: SWMU # 14 & 13
Page: ____ of ____

Onsite Personnel:

Name	Affiliation	PPE (include modifications and times)
TOM NISSEN	THC	MOD LEVEL D (HARD TOE BOOTS, SAFETY GLASSES, DISP GLOVES, EAR PROTECTION)
CHARLIE DEWOLF	THC	
MARK YIATRAS	GEO	
STEVE GRACE	GEO	

Health and Safety Data:

Time of Measurement	Collection Area	TOV (ppm)	% LEL	pH	Air Temperature	Other (Specify)
1400	WAREHOUSE SWMU #14	8.8	0.0	—	75°F	RIG RUNNING, TOV FROM EXHAUST
~~1525~~	~~WAREHOUSE SWMU #13~~	~~0.0~~	~~0.0~~	~~—~~	~~75°F~~	CONDUCTED SAMPLE HANDLING OUTSIDE
~~1525~~						
1525	WAREHOUSE SWMU #13	0.0	0.0	—	75°F	RIG NOT RUNNING. ALL SAMPLE HANDLING OUTSIDE

Site Safety Officer

Thomas Olson

Form 04

5

SOIL SAMPLING
SITE CONDITION WORKSHEET

Date: 8/10/94

Job #: 44-01

Sampling Location: AOC #16

Page: 3 of

Arrival Time: 0700

Sampling Team Members	Affiliation
CHARLIE DEWOLF	TRIHYDRO
TOM NISSEN	"
MARK VIATRAS	GEO ENVIR
STEVE GRACE	"

Others Present:

NONE

Sampling site condition upon arrival (concrete cover, standing water, erosion, etc.):

GRASS COVER, GROUND SLIGHTLY UNEVEN

Weather conditions (include significant condition changes and times):

PARTLY SUNNY, 65°F, LIGHT VARIABLE BREEZE, PLEASANT

Miscellaneous site notes: THIS SHEET (AOC #16) FOR SAMPLES RFI-1 thru RFI-4

Time of Sampling Commencement: 0715 - 0905

Thomas C. [illegible]
Observer

Form 03

SOIL SAMPLE
COLLECTION WORKSHEET

Date: AUG 10, 1994
Job #: 44-01 PEKIN RFI
Sampling Location: SWMU # 14 & SWMU # 13
Collected By: T. NISSEN
C. DEWOLF

Sample Designation[1]	Collection Time	Sampling Depth	TOV (ppm)	Custody Tag Number (if applicable)	Comments (purpose, method, containers/analyses)
RFI-5 (3-5)	1420	3.0-5.0	0.0		DETERMINE IF RELEASE OCCURRED FROM SWMU #14
RFI-5 (5-7)	1425	5.0-7.0	0.0		"
RFI-6 (3-5)	1500	3.0-5.0	3.4		"
RFI-6 (5-7)	1505	5.0-7.0	3.4		"
RFI-7 (4-6)	1540	4.0-6.0	1.1		DETERMINE IF RELEASE OCCURRED FROM SWMU #13
RFI-7 (6-8)	1545	6.0-8.0	1.1		" "
RFI-8 (4-6)	1610	4.0-6.0	1.1		" "
RFI-8 (6-8)	1625	6.0-8.0	1.1		" "
RFI-9 (4-6)	1640	4.0-6.0	1.1		" "
RFI-9 (6-8)	1645	6.0-8.0	1.1		" "
RFI-10 (4-6)	1740	4.0-6.0	1.1		" "
RFI-10 (6-8)	1745	6.0-8.0	1.1		" "
RFI-21 (10-12)[1]	1730	6.0-8.0	0.0		BLIND DUPLICATE OF RFI-9 (6.0-8.0)

[1] Annotate sample duplicates. Duplicate field screening concentrations must be within 30% of sample concentration. Annotate precision percentage in comments.

Chad P DeWolf
Sampler

7

SOIL SAMPLING
SITE CONDITION WORKSHEET

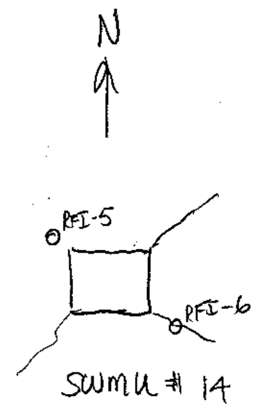
Date: Aug 10, 1994
Job #: 44-01 PEKIN RFI
Sampling Location: SWMU # 14 & 13
Page: ________ of ________

Arrival Time: 1340

Sampling Team Members	Affiliation
TOM NISSEN	TRIHYDRO
CHARLIE DEWOLF	TRIHYDRO
MARK YIATRAS	GEO ENV.
STEVE GRACK	GEO ENV

Others Present:

NONE



Sampling site condition upon arrival (concrete cover, standing water, erosion, etc.):

CONCRETE FLOOR, SUMP CAPPED WITH CONCRETE. CRACKS EXTEND FROM 3 CORNERS OF SUMP AREA

Weather conditions (include significant condition changes and times): CLOUDY, T-STORMS PREDICTED, 75°F, LIGHT VARIABLE BREEZE

Miscellaneous site notes: WAREHOUSE DOORS OPEN FOR VENTILATION, THIS SHEET FOR SWMU #14, LOCATIONS RFI-5 & RFI-6 AND SWMU #13, LOCATIONS RFI-7, 8, 9 & 10

Time of Sampling Commencement: 1410

Tom Nissen
Observer

Form 03

SOIL SAMPLE
COLLECTION WORKSHEET

Date: 8/10/94
Job #: 44-01 SK PEKIN RFI
Sampling Location: AOC #16
Collected By: T. NISSEN / C. DEWOLF

NOTE: SWITCHED FROM 10.0 eV to 10.6 eV PID BTWN RFI-1 & RFI-2

Sample Designation[1]	Collection Time	Sampling Depth	TOV (ppm)	Custody Tag Number (if applicable)	Comments (purpose, method, containers/analyses)
RFI-1 (2-4)	0720	2.0-4.0'	0.0		DETERMINE WHETHER OIL RELEASE REMAINS / VERIFY EFFECTIVENESS OF CLEANUP
RFI-1 (4-6)	0725	4.0-6.0'	0.0		" " " "
RFI-2 (0-2)	0755	0.0-2.0'	1.3		" " " "
RFI-2 (2-4)	0800	2.0-4.0'	0.7		" " "
RFI-2 (4-6)	0805	4.0-6.0'	1.0		CONTINGENT FOR ANALYSIS BASED ON TPH SCREEN
RFI-3 (0-2)	0825	0.0-2.0	1.4		SAME AS RFI-1 & RFI-2
RFI-3 (2-4)	0830	2.0-4.0	1.0		"
RFI-3 (4-6)	0835	4.0-6.0	1.1		CONTINGENT FOR ANALYSIS
RFI-4 (0-2)	0845	0.0-2.0	2.2		SAME AS FOR RFI 1- RFI-3
RFI-4 (2-4)	0850	2.0-4.0	1.3		"
RFI-4 (4-6)	0855	4.0-6.0	1.6		CONTINGENT
DUP RFI-1 (2-4) → RFI-20 (6-8)[1]	0905	2.0-4.0	--		BLIND DUPLICATE OF RFI-1 (2-4)

[1] Annotate sample duplicates. Duplicate field screening concentrations must be within 30% of sample concentration. Annotate precision percentage in comments.

Thomas C Nissen
Sampler
Charles P DeWolf

Form 05

2

DAILY FIELD MEMORANDUM

Date: AUG 11, 1994

Field Personnel: T. NISSEN — MARK VIATRAS

C. DEWOLF — STEVE GRACE

J. BEDESSEM

Forms Completed as Attachments to this Memorandum*:

NONE

* Note: Ensure all forms are signed by field personnel

Activity Log:

Time	Activity	Location
0700-0800	SET UP, WAIT FOR SK TO FINISH LOADING @ R/F	EOD-6
0800-0945	DRILL, SAMPLE & PLUG EOD-6	EOD-6
0945-1000	BREAK	i
* 1000-1030	CHECK SOUTH OF RFI-1 FOR NATIVE SOIL - FOUND	S. OF AOC #16
1030-12:00	DRILL & SAMPLE EOD-7	EOD-7
12:00-1:00	LUNCH	
13:00-1425	EOD-8	
* 14:30-1600	EOD-9	
1630-1730	EOD-10	
1730-1815	CLEAN UP SITE	

Signatures:

Field Personnel

Project Manager

Form 01

DAILY FIELD MEMORANDUM

Date: Aug 12 1994

Field Personnel: TOM NISSEN | STEVE GRACE
CHARLIE DEWOLF
MARK VIATRAS

Forms Completed as Attachments to this Memorandum*:

NONE

* Note: Ensure all forms are signed by field personnel

Activity Log:

Time	Activity	Location
0730	SET UP, DISCUSSION W/ DAN	
* 0815-845	BG-1	
* 0900-0920	BG-2	
* 0945-1100	BG-3	
1100-1130	HOLD, WAIT FOR TRUCKS TO LOAD	
1130-1330	EOD-11	
1330-1400	CLEAN + PATCH	
1400-1500	LUNCH	
1500-1630	DRILLERS DEPART, PACK, CLEAN	
1630-1745	TO UPS TO SHIP, PICKUP RENTAL CAR	

Signatures:

Charles P DeWolf

Field Personnel

Tom Nissen

Project Manager

APPENDIX C

LABORATORY ANALYTICAL REPORTS
RFI PHASE I RELEASE ASSESSMENT
PEKIN SERVICE CENTER

APPENDIX C-1

LABORATORY ANALYTICAL RESULTS
SOIL QUALITY DATA

Case Narrative Pekin, IL, Project 94-053, 94-055

Semi-Volatile Analysis:

The following five surrogates were used for all semi-volatile analysis. The recovery limits are the same as given in Method 8270A. This laboratory uses five of the six surrogates available. These five surrogates will detect any problems associated with the extraction or analysis of semi-volatile compounds.

Compound	Recovery Limit
2-Fluorophenol	30-115
Phenol-d6	24-113
Nitrobenzene-d8	23-120
2-Fluorobiphenyl	30-115
2,4,6-Tribromophenol	19-122

Surrogate recoveries were low for Nitrobenzene and 2-Fluorobiphenyl due to the characteristics of the sample. This is typical of certain soil types.

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

Metals in TCLP Leachate

		Work Order #	33	34	35	36	37
		Collector's Sample #	EOD-7 (13-15)	EOD-7 (34 - 36)	EOD-8 (13-15)	EOD-8 (34-36)	EOD-9 (34-36)
		Date Sampled	8/11/94	8/11/94	8/11/94	8/11/94	8/11/94
		Date Leached	8/20/94	8/20/94	8/20/94	8/20/94	8/20/94
		Date Analyzed (EPA Method 7060)	8/27/94	8/27/94	8/27/94	8/27/94	8/27/94
		Date Analyzed (EPA Method 7131)	8/27/94	8/27/94	8/27/94	8/27/94	8/27/94
		Date Analyzed (EPA Method 7191)	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94
		Date Analyzed (EPA Method 7421)	8/25/94	8/25/94	8/25/94	8/25/94	8/25/94
Analyte	**EPA Method**	**Reporting Limit mg/L**	**Concentration mg/L**				
Arsenic	7060	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	7131	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
mium	7191	0.1	<0.10	<0.10	<0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075

		Work Order #	38	39	40	41	50
		Collector's Sample #	EOD-10 (13-15)	EOD-10 (34 - 36)	EOD-2A (5.5-7.5)	EOD-2A (34-36)	EOD-9 (0.5-2.5)
		Date Sampled	8/11/94	8/11/94	8/12/94	8/12/94	8/11/94
		Date Leached	8/20/94	8/20/94	8/20/94	8/20/94	8/23/94
		Date Analyzed (EPA Method 7060)	8/27/94	8/27/94	8/27/94	8/27/94	8/25/94
		Date Analyzed (EPA Method 7131)	8/27/94	8/27/94	8/27/94	8/27/94	8/26/94
		Date Analyzed (EPA Method 7191)	8/29/94	8/29/94	8/29/94	8/29/94	8/26/94
		Date Analyzed (EPA Method 7421)	8/25/94	8/25/94	8/25/94	8/25/94	8/27/94
Analyte	**EPA Method**	**Reporting Limit mg/L**	**Concentration mg/L**				
Arsenic	7060	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	7131	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
omium	7191	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

Metals in TCLP Leachate

		Work Order #	51	52	53	54	55
		Collector's Sample #	EOD-9 (32-34)	BG-1 (0.5-2.5)	BG-1 (8-10)	BG-2 (0.5-2.5)	BG-2 (13-15)
		Date Sampled	8/11/94	8/12/94	8/12/94	8/12/94	8/12/94
		Date Leached	8/23/94	8/23/94	8/23/94	8/23/94	8/23/94
		Date Analyzed (EPA Method 7060)	8/25/94	8/25/94	8/25/94	8/25/94	8/25/94
		Date Analyzed (EPA Method 7131)	8/26/94	8/26/94	8/26/94	8/26/94	8/26/94
		Date Analyzed (EPA Method 7191)	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94
		Date Analyzed (EPA Method 7421)	8/27/94	8/27/94	8/27/94	8/27/94	8/27/94
Analyte	**EPA Method**	**Reporting Limit mg/L**	**Concentration mg/L**				
Arsenic	7060	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	7131	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	7191	0.1	<0.10	<0.10	<0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075

		Work Order #	56	57
		Collector's Sample #	BG-3 (0.5-2.5)	BG-3 (14-16)
		Date Sampled	8/12/94	8/12/94
		Date Leached	8/23/94	8/23/94
		Date Analyzed (EPA Method 7060)	8/25/94	8/25/94
		Date Analyzed (EPA Method 7131)	8/26/94	8/26/94
		Date Analyzed (EPA Method 7191)	8/29/94	8/29/94
		Date Analyzed (EPA Method 7421)	8/27/94	8/29/94
Analyte	**EPA Method**	**Reporting Limit mg/L**	**Concentration mg/L**	
Arsenic	7060	0.05	<0.05	<0.05
Cadmium	7131	0.005	<0.005	<0.005
Chromium	7191	0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/5/94

ANALYTICAL RESULTS

Metals in TCLP Leachate

		Work Order #	08	09	10	11	12
		Collector's Sample #	RFI-1 (2-4)	RFI-1 (4-6)	RFI-2 (0-2)	RFI-2 (2-4)	RFI-3 (0-2)
		Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
		Date Leached	8/17/94	8/17/94	8/17/94	8/18/94	8/18/94
		Date Analyzed (EPA Method 7060)	8/20/94	8/20/94	8/20/94	8/24/94	8/24/94
		Date Analyzed (EPA Method 6010)	8/22/94	8/22/94	8/22/94	8/24/94	8/24/94
		Date Analyzed (EPA Method 7131)	8/22/94	8/22/94	8/22/94	8/24/94	8/24/94
		Date Analyzed (EPA Method 7421)	8/25/94	8/25/94	8/29/94	8/27/94	8/27/94
		Date Analyzed (EPA Method 7470)	8/20/94	8/20/94	8/20/94	8/20/94	8/20/94
		Date Analyzed (EPA Method 7740)	8/26/94	8/26/94	8/26/94	8/26/94	8/26/94
		Date Analyzed (EPA Method 7761)	8/26/94	8/26/94	8/26/94	8/26/94	8/26/94
Analyte	EPA Method	Reporting Limit mg/L	Concentration mg/L				
Arsenic	7060	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	6010	2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Cadmium	7131	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	6010	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	7470	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Selenium	7740	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	7761	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

ALYTICAL REVIEW / DATE: ______

Project ID #: 44-02

Project ID Name: SK - Pekin

Lab Project #: 94-053

Date Reported: 12/5/94

ANALYTICAL RESULTS

Metals in TCLP Leachate

		Work Order #	13	14	15	16	17
		Collector's Sample #	RFI-3 (0-2)	RFI-4 (0-2)	RFI-4 (2-4)	RFI-20 (6-8)	RFI-5 (3-5)
		Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
		Date Leached	8/18/94	8/18/94	8/18/94	8/18/94	8/18/94
		Date Analyzed (EPA Method 7060)	8/24/94	8/24/94	8/24/94	8/24/94	8/24/94
		Date Analyzed (EPA Method 6010)	8/24/94	8/24/94	8/24/94	8/24/94	8/24/94
		Date Analyzed (EPA Method 7131)	8/24/94	8/24/94	8/24/94	8/24/94	8/24/94
		Date Analyzed (EPA Method 7421)	8/27/94	8/27/94	8/27/94	8/27/94	8/27/94
		Date Analyzed (EPA Method 7470)	8/20/94	8/20/94	8/20/94	8/20/94	8/20/94
		Date Analyzed (EPA Method 7740)	8/26/94	8/29/94	8/29/94	8/29/94	8/29/94
		Date Analyzed (EPA Method 7761)	8/26/94	8/26/94	8/26/94	8/26/94	8/26/94
Analyte	**EPA Method**	**Reporting Limit mg/L**	**Concentration mg/L**				
Arsenic	7060	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	6010	2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Cadmium	7131	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	6010	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	7470	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Selenium	7740	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	7761	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Review / Date:

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ANALYTICAL RESULTS

Metals in TCLP Leachate

		Work Order #	18	19	20	21	22
		Collector's Sample #	RFI-5 (5-7)	RFI-6 (3-5)	RFI-6 (5-7)	RFI-7 (4-6)	RFI-7 (6-8)
		Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
		Date Leached	8/18/94	8/18/94	8/18/94	8/18/94	8/19/94
		Date Analyzed (EPA Method 7060)	8/24/94	8/24/94	8/24/94	8/24/94	8/24/94
		Date Analyzed (EPA Method 6010)	8/24/94	8/24/94	8/24/94	8/24/94	8/24/94
		Date Analyzed (EPA Method 7131)	8/24/94	8/24/94	8/24/94	8/24/94	8/24/94
		Date Analyzed (EPA Method 7421)	8/27/94	8/27/94	8/27/94	8/27/94	8/27/94
		Date Analyzed (EPA Method 7470)	8/20/94	8/20/94	8/20/94	8/20/94	8/22/94
		Date Analyzed (EPA Method 7740)	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94
		Date Analyzed (EPA Method 7761)	8/26/94	8/26/94	8/26/94	8/26/94	8/26/94
Analyte	**EPA Method**	**Reporting Limit mg/L**	**Concentration mg/L**				
Arsenic	7060	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	6010	2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Cadmium	7131	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	6010	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	7470	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Selenium	7740	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	7761	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Review / Date:

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ANALYTICAL RESULTS

Metals in TCLP Leachate

		Work Order #	23	24	25	26	27
		Collector's Sample #	RFI-8 (4-6)	RFI-8 (6-8)	RFI-9 (4-6)	RFI-9 (6-8)	RFI-10 (4-6)
		Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
		Date Leached	8/19/94	8/19/94	8/19/94	8/19/94	8/19/94
		Date Analyzed (EPA Method 7060)	8/24/94	8/24/94	8/24/94	8/24/94	8/24/94
		Date Analyzed (EPA Method 6010)	8/24/94	8/24/94	8/24/94	8/24/94	8/24/94
		Date Analyzed (EPA Method 7131)	8/24/94	8/24/94	8/29/94	8/24/94	8/24/94
		Date Analyzed (EPA Method 7421)	8/27/94	8/27/94	8/27/94	8/27/94	8/27/94
		Date Analyzed (EPA Method 7470)	8/22/94	8/22/94	8/22/94	8/22/94	8/22/94
		Date Analyzed (EPA Method 7740)	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94
		Date Analyzed (EPA Method 7761)	8/26/94	8/26/94	8/26/94	8/26/94	8/26/94
Analyte	EPA Method	Reporting Limit mg/L	Concentration mg/L				
Arsenic	7060	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	6010	2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Cadmium	7131	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	6010	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	7470	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Selenium	7740	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	7761	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Review / Date:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/5/94

ANALYTICAL RESULTS

Metals in TCLP Leachate

		Work Order #	28	29	42	43	44
		Collector's Sample #	RFI-10 (6-8)	RFI-21 (10-12)	EOD-9A (0.5-2.5)	BG-1A (0.5-2.5)	BG-2A (0.5-2.5)
		Date Sampled	8/10/94	8/10/94	8/12/94	8/12/94	8/12/94
		Date Leached	8/19/94	8/19/94	8/20/94	8/20/94	8/20/94
		Date Analyzed (EPA Method 7060)	8/24/94	8/24/94	8/27/94	8/27/94	8/27/94
		Date Analyzed (EPA Method 6010)	8/24/94	8/24/94	8/24/94	8/24/94	8/24/94
		Date Analyzed (EPA Method 7131)	8/24/94	8/24/94	8/27/94	8/27/94	8/27/94
		Date Analyzed (EPA Method 7421)	8/27/94	8/27/94	8/25/94	8/25/94	8/25/94
		Date Analyzed (EPA Method 7470)	8/22/94	8/22/94	8/22/94	8/22/94	8/22/94
		Date Analyzed (EPA Method 7740)	8/29/94	8/29/94	8/29/94	8/29/94	8/29/94
		Date Analyzed (EPA Method 7761)	8/26/94	8/27/94	8/27/94	8/27/94	8/27/94
nalyte	EPA Method	Reporting Limit mg/L	Concentration mg/L				
Arsenic	7060	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	6010	2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Cadmium	7131	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	6010	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	7470	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Selenium	7740	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	7761	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

lytical Review / Date:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/5/94

ANALYTICAL RESULTS

Metals in TCLP Leachate

Work Order #			45	46	47	48	49
Collector's Sample #			BG-3 (2-4)	EOD-9 (5-7)	BG-1 (13-15)	BG-2 (8-10)	BG-3 (18-20)
Date Sampled			8/12/94	8/11/94	8/12/94	8/12/94	8/12/94
Date Leached			8/20/94	8/23/94	8/23/94	8/23/94	8/23/94
Date Analyzed (EPA Method 7060)			8/27/94	8/25/94	8/25/94	8/25/94	8/25/94
Date Analyzed (EPA Method 6010)			8/24/94	8/24/94	8/24/94	8/24/94	8/24/94
Date Analyzed (EPA Method 7131)			8/27/94	8/26/94	8/26/94	8/26/94	8/26/94
Date Analyzed (EPA Method 7421)			8/29/94	8/27/94	8/27/94	8/27/94	8/27/94
Date Analyzed (EPA Method 7470)			8/22/94	8/24/94	8/24/94	8/24/94	8/24/94
Date Analyzed (EPA Method 7740)			8/29/94	8/29/94	8/29/94	8/29/94	8/29/94
Date Analyzed (EPA Method 7761)			8/26/94	8/27/94	8/27/94	8/27/94	8/26/94
Analyte	**EPA Method**	**Reporting Limit mg/L**	**Concentration mg/L**				
Arsenic	7060	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	6010	2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Cadmium	7131	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	6010	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Lead	7421	0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Mercury	7470	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Selenium	7740	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	7761	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Review / Date:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	08	09	10	11	12
	Collector's Sample #	RFI-1 (2-4)	RFI-1 (4-6)	RFI-2 (0-2)	RFI-2 (2-4)	RFI-3 (0-2)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Extracted	8/16/94	8/16/94	8/16/94	8/16/94	8/16/94
	Date Analyzed	8/19/94	8/19/94	8/20/94	8/20/94	8/20/94
Analyte	**Reporting Limit mg/Kg**	**Concentration mg/Kg**				
Acenaphthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Acenaphthylene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Anthracene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(a)anthracene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(b)fluoranthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(k)fluoranthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(ghi)perylene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(a)pyrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzyl alcohol	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
Bis(2-chloroethoxy)methane	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Bis(2-chloroethyl)ether	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Bis(2-ethylhexyl)phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
4-Bromophenyl phenyl ether	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Butyl benzyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
p-Chloroaniline*	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
p-Chloro-m-cresol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2-Chloronaphthalene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2-Chlorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
4-Chlorophenyl phenyl ether	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

Work Order #		08	09	10	11	12
Collector's Sample #		RFI-1 (2-4)	RFI-1 (4-6)	RFI-2 (0-2)	RFI-2 (2-4)	RFI-3 (0-2)
Date Sampled		8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
Date Extracted		8/16/94	8/16/94	8/16/94	8/16/94	8/16/94
Date Analyzed		8/19/94	8/19/94	8/20/94	8/20/94	8/20/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg				
Chrysene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
m-cresol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
o-cresol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
esol	0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Dibenz(a,h)anthracene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Dibenzofuran	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Di-n-butyl phthalate	0.66	2.90	2.40	0.84	2.70	0.73
o-Dichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
m-Dichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
p-Dichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
3,3'-Dichlorobenzidine	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
2,4-Dichlorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Diethyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2,4-Dimethylphenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Dimethyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2,4-Dinitrophenol	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
2,4-Dinitrotoluene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Dinitrotoluene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Di-n-octyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	08	09	10	11	12
	Collector's Sample #	RFI-1 (2-4)	RFI-1 (4-6)	RFI-2 (0-2)	RFI-2 (2-4)	RFI-3 (0-2)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Extracted	8/16/94	8/16/94	8/16/94	8/16/94	8/16/94
	Date Analyzed	8/19/94	8/19/94	8/20/94	8/20/94	8/20/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg				
Fluoranthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Fluorene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Hexachlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
[illegible]achlorobutadiene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Hexachlorocyclopentadiene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Hexachloroethane	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Indeno(1,2,3-c,d)pyrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Isophorone	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2-Methyl-4,6-dinitrophenol	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
2-Methylnaphthalene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Naphthalene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
o-Nitroaniline	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
m-Nitroaniline	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
p-Nitroaniline	ND	<7.2	<7.2	<7.2	<7.2	<7.2
Nitrobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
o-Nitrophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
p-Nitrophenol	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
[illegible]tachlorophenol	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
Phenanthrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/5/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

Work Order #		08	09	10	11	12
Collector's Sample #		RFI-1 (2-4)	RFI-1 (4-6)	RFI-2 (0-2)	RFI-2 (2-4)	RFI-3 (0-2)
Date Sampled		8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
Date Extracted		8/16/94	8/16/94	8/16/94	8/16/94	8/16/94
Date Analyzed		8/19/94	8/19/94	8/20/94	8/20/94	8/20/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg				
Phenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Pyrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
1,2,4-Trichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
[illegible],5-Trichlorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2,4,6-Trichlorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

* Due to matrix interference of this compound the PQL is 10.45.

ALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

Work Order #		13	14	15	16	17
Collector's Sample #		RFI-3 (0-2)	RFI-4 (0-2)	RFI-4 (2-4)	RFI-20 (6-8)	RFI-5 (3-5)
Date Sampled		8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
Date Extracted		8/16/94	8/16/94	8/16/94	8/16/94	8/16/94
Date Analyzed		8/20/94	8/20/94	8/20/94	8/20/94	8/24/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg				
Acenaphthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Acenaphthylene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Anthracene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
zo(a)anthracene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(b)fluoranthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(k)fluoranthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(ghi)perylene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(a)pyrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzyl alcohol	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
Bis(2-chloroethoxy)methane	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Bis(2-chloroethyl)ether	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Bis(2-ethylhexyl)~~ether~~ phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
4-Bromophenyl phenyl ether	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Butyl benzyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
p-Chloroaniline*	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
p-Chloro-m-cresol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2-Chloronaphthalene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
hlorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
4-Chlorophenyl phenyl ether	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	13	14	15	16	17
	Collector's Sample #	RFI-3 (0-2)	RFI-4 (0-2)	RFI-4 (2-4)	RFI-20 (6-8)	RFI-5 (3-5)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Extracted	8/16/94	8/16/94	8/16/94	8/16/94	8/16/94
	Date Analyzed	8/20/94	8/20/94	8/20/94	8/20/94	8/24/94
Analyte	**Reporting Limit mg/Kg**	**Concentration mg/Kg**				
Chrysene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
m-cresol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
o-cresol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
[illegible]esol	0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Dibenz(a,h)anthracene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Dibenzofuran	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Di-n-butyl phthalate	0.66	2.80	1.30	4.80	7.40	<0.66
o-Dichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
m-Dichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
p-Dichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
3,3'-Dichlorobenzidine	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
2,4-Dichlorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Diethyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2,4-Dimethylphenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Dimethyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2,4-Dinitrophenol	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
2,4-Dinitrotoluene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
[illegible] Dinitrotoluene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Di-n-octyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	13	14	15	16	17
	Collector's Sample #	RFI-3 (0-2)	RFI-4 (0-2)	RFI-4 (2-4)	RFI-20 (6-8)	RFI-5 (3-5)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Extracted	8/16/94	8/16/94	8/16/94	8/16/94	8/16/94
	Date Analyzed	8/20/94	8/20/94	8/20/94	8/20/94	8/24/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg				
Fluoranthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Fluorene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Hexachlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
[illegible]achlorobutadiene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Hexachlorocyclopentadiene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Hexachloroethane	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Indeno(1,2,3-c,d)pyrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Isophorone	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2-Methyl-4,6-dinitrophenol	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
2-Methylnaphthalene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Naphthalene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
o-Nitroaniline	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
m-Nitroaniline	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
p-Nitroaniline	ND	<7.2	<7.2	<7.2	<7.2	<7.2
Nitrobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
o-Nitrophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
p-Nitrophenol	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
[illegible]tachlorophenol	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
Phenanthrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/5/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	13	14	15	16	17
	Collector's Sample #	RFI-3 (0-2)	RFI-4 (0-2)	RFI-4 (2-4)	RFI-20 (6-8)	RFI-5 (3-5)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Extracted	8/16/94	8/16/94	8/16/94	8/16/94	8/16/94
	Date Analyzed	8/20/94	8/20/94	8/20/94	8/20/94	8/24/94
Analyte	**Reporting Limit mg/Kg**	**Concentration mg/Kg**				
Phenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Pyrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
1,2,4-Trichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
[illegible]5-Trichlorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2,4,6-Trichlorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

* Due to matrix interference of this compound the PQL is 10.45.

[illegible]LYTICAL REVIEW / DATE: ______________________

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	18	19	20	21	22
	Collector's Sample #	RFI-5 (5-7)	RFI-6 (3-5)	RFI-6 (5-7)	RFI-7 (4-6)	RFI-7 (6-8)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Extracted	8/18/94	8/18/94	8/22/94	8/22/94	8/22/94
	Date Analyzed	8/24/94	8/24/94	8/24/94	8/24/94	8/24/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg				
Acenaphthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Acenaphthylene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Anthracene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
o(a)anthracene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(b)fluoranthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(k)fluoranthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(ghi)perylene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(a)pyrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzyl alcohol	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
Bis(2-chloroethoxy)methane	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Bis(2-chloroethyl)ether	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Bis(2-ethylhexyl)~~ether~~ phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
4-Bromophenyl phenyl ether	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Butyl benzyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
p-Chloroaniline*	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
p-Chloro-m-cresol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2-Chloronaphthalene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
ılorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
4-Chlorophenyl phenyl ether	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	18	19	20	21	22
	Collector's Sample #	RFI-5 (5-7)	RFI-6 (3-5)	RFI-6 (5-7)	RFI-7 (4-6)	RFI-7 (6-8)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Extracted	8/18/94	8/18/94	8/22/94	8/22/94	8/22/94
	Date Analyzed	8/24/94	8/24/94	8/24/94	8/24/94	8/24/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg				
Chrysene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
m-cresol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
o-cresol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
ɜsol	0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Dibenz(a,h)anthracene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Dibenzofuran	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Di-n-butyl phthalate	0.66	3.30	3.70	<0.66	<0.66	<0.66
o-Dichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
m-Dichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
p-Dichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
3,3'-Dichlorobenzidine	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
2,4-Dichlorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Diethyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2,4-Dimethylphenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Dimethyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2,4-Dinitrophenol	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
2,4-Dinitrotoluene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Dinitrotoluene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Di-n-octyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	18	19	20	21	22
	Collector's Sample #	RFI-5 (5-7)	RFI-6 (3-5)	RFI-6 (5-7)	RFI-7 (4-6)	RFI-7 (6-8)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Extracted	8/18/94	8/18/94	8/22/94	8/22/94	8/22/94
	Date Analyzed	8/24/94	8/24/94	8/24/94	8/24/94	8/24/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg				
Fluoranthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Fluorene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Hexachlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
achlorobutadiene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Hexachlorocyclopentadiene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Hexachloroethane	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Indeno(1,2,3-c,d)pyrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Isophorone	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2-Methyl-4,6-dinitrophenol	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
2-Methylnaphthalene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Naphthalene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
o-Nitroaniline	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
m-Nitroaniline	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
p-Nitroaniline	ND	<7.2	<7.2	<7.2	<7.2	<7.2
Nitrobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
o-Nitrophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
p-Nitrophenol	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
tachlorophenol	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
Phenanthrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/5/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	18	19	20	21	22
	Collector's Sample #	RFI-5 (5-7)	RFI-6 (3-5)	RFI-6 (5-7)	RFI-7 (4-6)	RFI-7 (6-8)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Extracted	8/18/94	8/18/94	8/22/94	8/22/94	8/22/94
	Date Analyzed	8/24/94	8/24/94	8/24/94	8/24/94	8/24/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg				
Phenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Pyrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
1,2,4-Trichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
5-Trichlorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2,4,6-Trichlorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

* Due to matrix interference of this compound the PQL is 10.45.

ALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

Work Order #		23	24	25	26	27
Collector's Sample #		RFI-8 (4-6)	RFI-8 (6-8)	RFI-9 (4-6)	RFI-9 (6-8)	RFI-10 (4-6)
Date Sampled		8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
Date Extracted		8/22/94	8/22/94	8/17/94	8/17/94	8/17/94
Date Analyzed		8/23/94	8/23/94	8/20/94	8/22/94	8/22/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg				
Acenaphthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Acenaphthylene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Anthracene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
zo(a)anthracene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(b)fluoranthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(k)fluoranthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(ghi)perylene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzo(a)pyrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Benzyl alcohol	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
Bis(2-chloroethoxy)methane	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Bis(2-chloroethyl)ether	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Bis(2-ethylhexyl)~~ether~~ phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
4-Bromophenyl phenyl ether	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Butyl benzyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
p-Chloroaniline*	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
p-Chloro-m-cresol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2-Chloronaphthalene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
lorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
4-Chlorophenyl phenyl ether	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	23	24	25	26	27
	Collector's Sample #	RFI-8 (4-6)	RFI-8 (6-8)	RFI-9 (4-6)	RFI-9 (6-8)	RFI-10 (4-6)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Extracted	8/22/94	8/22/94	8/17/94	8/17/94	8/17/94
	Date Analyzed	8/24/94	8/24/94	8/20/94	8/22/94	8/22/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg				
Chrysene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
m-cresol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
o-cresol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
[illegible]sol	0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Dibenz(a,h)anthracene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Dibenzofuran	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Di-n-butyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
o-Dichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
m-Dichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
p-Dichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
3,3'-Dichlorobenzidine	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
2,4-Dichlorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Diethyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2,4-Dimethylphenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Dimethyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2,4-Dinitrophenol	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
2,4-Dinitrotoluene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
[illegible] Dinitrotoluene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Di-n-octyl phthalate	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

ANALYTICAL REVIEW / DATE:

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	23	24	25	26	27
	Collector's Sample #	RFI-8 (4-6)	RFI-8 (6-8)	RFI-9 (4-6)	RFI-9 (6-8)	RFI-10 (4-6)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Extracted	8/22/94	8/22/94	8/17/94	8/17/94	8/17/94
	Date Analyzed	8/24/94	8/24/94	8/20/94	8/22/94	8/22/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg				
Fluoranthene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Fluorene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Hexachlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
achlorobutadiene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Hexachlorocyclopentadiene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Hexachloroethane	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Indeno(1,2,3-c,d)pyrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Isophorone	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2-Methyl-4,6-dinitrophenol	1.30	<1.30	<1.30	<1.30	<1.30	<1.30
2-Methylnaphthalene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Naphthalene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
o-Nitroaniline	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
m-Nitroaniline	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
p-Nitroaniline	ND	<7.2	<7.2	<7.2	<7.2	<7.2
Nitrobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
o-Nitrophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
p-Nitrophenol	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
.tachlorophenol	3.30	<3.30	<3.30	<3.30	<3.30	<3.30
Phenanthrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/5/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	23	24	25	26	27
	Collector's Sample #	RFI-8 (4-6)	RFI-8 (6-8)	RFI-9 (4-6)	RFI-9 (6-8)	RFI-10 (4-6)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Extracted	8/22/94	8/22/94	8/17/94	8/17/94	8/17/94
	Date Analyzed	8/24/94	8/24/94	8/20/94	8/22/94	8/22/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg				
Phenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
Pyrene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
1,2,4-Trichlorobenzene	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
..,5-Trichlorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66
2,4,6-Trichlorophenol	0.66	<0.66	<0.66	<0.66	<0.66	<0.66

* Due to matrix interference of this compound the PQL is 10.45.

\LYTICAL REVIEW / DATE: ______

Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	28	29
	Collector's Sample #	RFI-10 (6-8)	RFI-21 (10-12)
	Date Sampled	8/10/94	8/10/94
	Date Extracted	8/17/94	8/17/94
	Date Analyzed	8/25/94	8/23/94
Analyte	**Reporting Limit mg/Kg**	**Concentration mg/Kg**	
Acenaphthene	0.66	<0.66	<0.66
Acenaphthylene	0.66	<0.66	<0.66
Anthracene	0.66	<0.66	<0.66
.o(a)anthracene	0.66	<0.66	<0.66
Benzo(b)fluoranthene	0.66	<0.66	<0.66
Benzo(k)fluoranthene	0.66	<0.66	<0.66
Benzo(ghi)perylene	0.66	<0.66	<0.66
Benzo(a)pyrene	0.66	<0.66	<0.66
Benzyl alcohol	1.30	<1.30	<1.30
Bis(2-chloroethoxy)methane	0.66	<0.66	<0.66
Bis(2-chloroethyl)ether	0.66	<0.66	<0.66
Bis(2-ethylhexyl)~~ether~~ phthalate	0.66	<0.66	<0.66
4-Bromophenyl phenyl ether	0.66	<0.66	<0.66
Butyl benzyl phthalate	0.66	<0.66	<0.66
p-Chloroaniline*	1.30	<1.30	<1.30
p-Chloro-m-cresol	0.66	<0.66	<0.66
2-Chloronaphthalene	0.66	<0.66	<0.66
.lorophenol	0.66	<0.66	<0.66
4-Chlorophenyl phenyl ether	0.66	<0.66	<0.66

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	28	29
	Collector's Sample #	RFI-10 (6-8)	RFI-21 (10-12)
	Date Sampled	8/10/94	8/10/94
	Date Extracted	8/17/94	8/17/94
	Date Analyzed	8/25/94	8/23/94
Analyte	Reporting Limit mg/Kg	Concentration mg/Kg	
Chrysene	0.66	<0.66	<0.66
m-cresol	0.66	<0.66	<0.66
o-cresol	0.66	<0.66	<0.66
ɘsol	0.33	<0.33	<0.33
Dibenz(a,h)anthracene	0.66	<0.66	<0.66
Dibenzofuran	0.66	<0.66	<0.66
Di-n-butyl phthalate	0.66	<0.66	<0.66
o-Dichlorobenzene	0.66	<0.66	<0.66
m-Dichlorobenzene	0.66	<0.66	<0.66
p-Dichlorobenzene	0.66	<0.66	<0.66
3,3'-Dichlorobenzidine	1.30	<1.30	<1.30
2,4-Dichlorophenol	0.66	<0.66	<0.66
Diethyl phthalate	0.66	<0.66	<0.66
2,4-Dimethylphenol	0.66	<0.66	<0.66
Dimethyl phthalate	0.66	<0.66	<0.66
2,4-Dinitrophenol	3.30	<3.30	<3.30
2,4-Dinitrotoluene	0.66	<0.66	<0.66
·Dinitrotoluene	0.66	<0.66	<0.66
Di-n-octyl phthalate	0.66	<0.66	<0.66

ANALYTICAL REVIEW / DATE:

Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	28	29
	Collector's Sample #	RFI-10 (6-8)	RFI-21 (10-12)
	Date Sampled	8/10/94	8/10/94
	Date Extracted	8/17/94	8/17/94
	Date Analyzed	8/25/94	8/23/94
Analyte	**Reporting Limit mg/Kg**	**Concentration mg/Kg**	
Fluoranthene	0.66	<0.66	<0.66
Fluorene	0.66	<0.66	<0.66
Hexachlorobenzene	0.66	<0.66	<0.66
chlorobutadiene	0.66	<0.66	<0.66
Hexachlorocyclopentadiene	0.66	<0.66	<0.66
Hexachloroethane	0.66	<0.66	<0.66
Indeno(1,2,3-c,d)pyrene	0.66	<0.66	<0.66
Isophorone	0.66	<0.66	<0.66
2-Methyl-4,6-dinitrophenol	1.30	<1.30	<1.30
2-Methylnaphthalene	0.66	<0.66	<0.66
Naphthalene	0.66	<0.66	<0.66
o-Nitroaniline	3.30	<3.30	<3.30
m-Nitroaniline	3.30	<3.30	<3.30
p-Nitroaniline	ND	<7.2	<7.2
Nitrobenzene	0.66	<0.66	<0.66
o-Nitrophenol	0.66	<0.66	<0.66
p-Nitrophenol	3.30	<3.30	<3.30
achlorophenol	3.30	<3.30	<3.30
Phenanthrene	0.66	<0.66	<0.66

ANALYTICAL REVIEW / DATE:

Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/5/94

ANALYTICAL RESULTS

RFI Semi-Volatile Organics in Soil

EPA Method 8270

	Work Order #	28	29
	Collector's Sample #	RFI-10 (6-8)	RFI-21 (10-12)
	Date Sampled	8/10/94	8/10/94
	Date Extracted	8/17/94	8/17/94
	Date Analyzed	8/25/94	8/23/94
Analyte	**Reporting Limit mg/Kg**	**Concentration mg/Kg**	
Phenol	0.66	<0.66	<0.66
Pyrene	0.66	<0.66	<0.66
1,2,4-Trichlorobenzene	0.66	<0.66	<0.66
[illegible]5-Trichlorophenol	0.66	<0.66	<0.66
2,4,6-Trichlorophenol	0.66	<0.66	<0.66

* Due to matrix interference of this compound the PQL is 10.45.

[illegible]LYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Volatile Organics in Soil

EPA Method 8240

	Work Order #	08	09	10	11	12
	Collector's Sample #	RFI-1 (2-4)	RFI-1 (4-6)	RFI-2 (0-2)	RFI-2 (2-4)	RFI-3 (0-2)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Analyzed	8/18/94	8/16/94	8/16/94	8/16/94	8/17/94
Analyte	Report Limit mg/Kg	Concentration mg/Kg				
Acetone	0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Benzene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bromodichloromethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bromoform	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
ıomethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Carbon Disulfide	0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Carbon Tetrachloride	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chlorobenzene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloroethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chloroform	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloromethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Dibromochloromethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1-Dichloroethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,2-Dichloroethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1-Dichloroethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-1,2-Dichloroethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,2-Dichloropropane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-1,3-Dichlorpropene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
s-1,3-Dichloropropene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	0.005	0.0053	<0.005	<0.005	<0.005	<0.005

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Volatile Organics in Soil

EPA Method 8240

	Work Order #	08	09	10	11	12
	Collector's Sample #	RFI-1 (2-4)	RFI-1 (4-6)	RFI-2 (0-2)	RFI-2 (2-4)	RFI-3 (0-2)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Analyzed	8/18/94	8/16/94	8/16/94	8/16/94	8/17/94
Analyte	Report Limit mg/Kg	Concentration mg/Kg				
2-Hexanone	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Methylene Chloride	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
2-Butanone	0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Methyl-2-pentanone	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1,2,2-Tetrachloroethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tetrachloroethene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1,1-Trichloroethane	0.005	<0.010	<0.010	<0.010	<0.010	<0.010
1,1,2-Trichloroethane	0.005	<0.010	<0.010	<0.010	<0.010	<0.010
Trichloroethene (TCE)	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Trichlorofluoromethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Trichlorotrifluoroethane	0.005	<0.010	<0.010	<0.010	<0.010	<0.010
trans-1,2-Dichloroethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vinyl Acetate	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Vinyl Chloride	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Xylene (Total)	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Volatile Organics in Soil

EPA Method 8240

	Work Order #	13	14	15	16	17
	Collector's Sample #	RFI-3 (0-2)	RFI-4 (0-2)	RFI-4 (2-4)	RFI-20 (6-8)	RFI-5 (3-5)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Analyzed	8/15/94	8/15/94	8/15/94	8/17/94	8/15/94
Analyte	Report Limit mg/Kg	Concentration mg/Kg				
Acetone	0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Benzene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bromodichloromethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bromoform	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
omethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Carbon Disulfide	0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Carbon Tetrachloride	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chlorobenzene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloroethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chloroform	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloromethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Dibromochloromethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1-Dichloroethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,2-Dichloroethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1-Dichloroethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-1,2-Dichloroethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,2-Dichloropropane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-1,3-Dichlorpropene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
s-1,3-Dichloropropene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Volatile Organics in Soil

EPA Method 8240

	Work Order #	13	14	15	16	17
	Collector's Sample #	RFI-3 (0-2)	RFI-4 (0-2)	RFI-4 (2-4)	RFI-20 (6-8)	RFI-5 (3-5)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Analyzed	8/17/94	8/15/94	8/15/94	8/17/94	8/15/94
Analyte	**Report Limit mg/Kg**	**Concentration mg/Kg**				
2-Hexanone	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Methylene Chloride	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Methyl ethyl ketone	0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Methyl-2-pentanone	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
[illegible]ne	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1,2,2-Tetrachloroethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tetrachloroethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1,1-Trichloroethane	0.005	<0.010	<0.010	<0.010	<0.010	<0.010
1,1,2-Trichloroethane	0.005	<0.010	<0.010	<0.010	<0.010	<0.010
Trichlrooethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Trichlorofluoromethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Trichlorotrifluoroethane	0.005	<0.010	<0.010	<0.010	<0.010	<0.010
trans-1,2-Dichloroethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vinyl Acetate	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Vinyl Chloride	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Xylene (Total)	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Volatile Organics in Soil

EPA Method 8240

	Work Order #	18	19	20	21	22
	Collector's Sample #	RFI-5 (5-7)	RFI-6 (3-5)	RFI-6 (5-7)	RFI-7 (4-6)	RFI-7 (6-8)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Analyzed	8/16/94	8/15/94	8/15/94	8/15/94	8/15/94
Analyte	Report Limit mg/Kg	Concentration mg/Kg				
Acetone	0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Benzene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bromodichloromethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bromoform	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
ıomethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Carbon Disulfide	0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Carbon Tetrachloride	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chlorobenzene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloroethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chloroform	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloromethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Dibromochloromethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1-Dichloroethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,2-Dichloroethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1-Dichloroethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-1,2-Dichloroethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,2-Dichloropropane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-1,3-Dichlorpropene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
;-1,3-Dichloropropene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Volatile Organics in Soil

EPA Method 8240

Work Order #		18	19	20	21	22
Collector's Sample #		RFI-5 (5-7)	RFI-6 (3-5)	RFI-6 (5-7)	RFI-7 (4-6)	RFI-7 (6-8)
Date Sampled		8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
Date Analyzed		8/16/94	8/15/94	8/15/94	8/15/94	8/15/94
Analyte	Report Limit mg/Kg	Concentration mg/Kg				
2-Hexanone	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Methylene Chloride	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Methyl ethyl ketone	0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Methyl-2-pentanone	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
[illegible]ne	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1,2,2-Tetrachloroethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tetrachloroethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1,1-Trichloroethane	0.005	<0.010	<0.010	<0.010	<0.010	<0.010
1,1,2-Trichloroethane	0.005	<0.010	<0.010	<0.010	<0.010	<0.010
Trichlrooethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Trichlorofluoromethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Trichlorotrifluoroethane	0.005	<0.010	<0.010	<0.010	<0.010	<0.010
trans-1,2-Dichloroethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vinyl Acetate	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Vinyl Chloride	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Xylene (Total)	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Volatile Organics in Soil

EPA Method 8240

	Work Order #	23	24	25	26	27
	Collector's Sample #	RFI-8 (4-6)	RFI-8 (6-8)	RFI-9 (4-6)	RFI-9 (6-8)	RFI-10 (4-6)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Analyzed	8/15/94	8/15/94	8/16/94	8/16/94	8/18/94
Analyte	Report Limit mg/Kg	Concentration mg/Kg				
Acetone	0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Benzene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bromodichloromethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bromoform	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
omethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Carbon Disulfide	0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Carbon Tetrachloride	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chlorobenzene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloroethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chloroform	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloromethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Dibromochloromethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1-Dichloroethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,2-Dichloroethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1-Dichloroethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-1,2-Dichloroethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,2-Dichloropropane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
cis-1,3-Dichlorpropene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
-1,3-Dichloropropene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Volatile Organics in Soil

EPA Method 8240

	Work Order #	23	24	25	26	27
	Collector's Sample #	RFI-8 (4-6)	RFI-8 (6-8)	RFI-9 (4-6)	RFI-9 (6-8)	RFI-10 (4-6)
	Date Sampled	8/10/94	8/10/94	8/10/94	8/10/94	8/10/94
	Date Analyzed	8/15/94	8/15/94	8/16/94	8/16/94	8/18/94
Analyte	**Report Limit mg/Kg**	**Concentration mg/Kg**				
2-Hexanone	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Methylene Chloride	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Methyl ethyl ketone	0.100	<0.100	<0.100	<0.100	<0.100	<0.100
4-Methyl-2-pentanone	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Styrene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1,2,2-Tetrachloroethane	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tetrachloroethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1,1-Trichloroethane	0.005	<0.010	<0.010	<0.010	<0.010	<0.010
1,1,2-Trichloroethane	0.005	<0.010	<0.010	<0.010	<0.010	<0.010
Trichlrooethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Trichlorofluoromethane	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Trichlorotrifluoroethane	0.005	<0.010	<0.010	<0.010	<0.010	<0.010
trans-1,2-Dichloroethylene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vinyl Acetate	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Vinyl Chloride	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Xylene (Total)	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

ANALYTICAL REVIEW / DATE:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Volatile Organics in Soil

EPA Method 8240

	Work Order #	28	29
	Collector's Sample #	RFI-10 (6-8)	RFI-21 (10-12)
	Date Sampled	8/10/94	8/10/94
	Date Analyzed	8/18/94	8/16/94
Analyte	Report Limit mg/Kg	Concentration mg/Kg	
Acetone	0.100	<0.100	<0.100
Benzene	0.005	<0.005	<0.005
Bromodichloromethane	0.005	<0.005	<0.005
Bromoform	0.005	<0.005	<0.005
[illegible]omethane	0.010	<0.010	<0.010
Carbon Disulfide	0.100	<0.100	<0.100
Carbon Tetrachloride	0.005	<0.005	<0.005
Chlorobenzene	0.005	<0.005	<0.005
Chloroethane	0.010	<0.010	<0.010
Chloroform	0.005	<0.005	<0.005
Chloromethane	0.010	<0.010	<0.010
Dibromochloromethane	0.005	<0.005	<0.005
1,1-Dichloroethane	0.005	<0.005	<0.005
1,2-Dichloroethane	0.005	<0.005	<0.005
1,1-Dichloroethylene	0.005	<0.005	<0.005
cis-1,2-Dichloroethylene	0.005	<0.005	<0.005
1,2-Dichloropropane	0.005	<0.005	<0.005
cis-1,3-Dichlorpropene	0.005	<0.005	<0.005
[illegible]s-1,3-Dichloropropene	0.005	<0.005	<0.005
Ethylbenzene	0.005	<0.005	<0.005

ANALYTICAL REVIEW / DATE:

Project ID Name: SK - Pekin

SK Lab Project #: 94-053

Date Reported: 12/2/94

ANALYTICAL RESULTS

RFI Volatile Organics in Soil

EPA Method 8240

	Work Order #	28	29
	Collector's Sample #	RFI-10 (6-8)	RFI-21 (10-12)
	Date Sampled	8/10/94	8/10/94
	Date Analyzed	8/18/94	8/16/94
Analyte	**Report Limit mg/Kg**	**Concentration mg/Kg**	
2-Hexanone	0.050	<0.050	<0.050
Methylene Chloride	0.005	<0.005	<0.005
Methyl ethyl ketone	0.100	<0.100	<0.100
4-Methyl-2-pentanone	0.050	<0.050	<0.050
S[illegible]ne	0.005	<0.005	<0.005
1,1,2,2-Tetrachloroethane	0.005	<0.005	<0.005
Tetrachloroethylene	0.005	<0.005	<0.005
Toluene	0.005	<0.005	<0.005
1,1,1-Trichloroethane	0.005	<0.010	<0.010
1,1,2-Trichloroethane	0.005	<0.010	<0.010
Trichlrooethylene	0.005	<0.005	<0.005
Trichlorofluoromethane	0.010	<0.010	<0.010
Trichlorotrifluoroethane	0.005	<0.010	<0.010
trans-1,2-Dichloroethylene	0.005	<0.005	<0.005
Vinyl Acetate	0.050	<0.050	<0.050
Vinyl Chloride	0.010	<0.010	<0.010
Xylene (Total)	0.005	<0.005	<0.005

ANALYTICAL REVIEW / DATE:

Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/5/94

ANALYTICAL RESULTS

Total Petroleum Hydrocarbons as Mineral Spirits in Soil

Modified EPA Method 8015

Extraction By EPA Method 3550

Reporting Limit: 50 mg/Kg

Work Order #	Collector's Sample #	Date Sampled	Date Extracted	Date Analyzed	Concentration mg/Kg
09	RFI-1 (4-6)	8/10/94	8/15/94	8/15/94	<50
11	RFI-2 (2-4)	8/10/94	8/15/94	8/16/94	<50
17	RFI-5 (3-5)	8/10/94	8/15/94	8/16/94	<50
18	RFI-5 (5-7)	8/10/94	8/15/94	8/16/94	<50
19	RFI-6 (3-5)	8/10/94	8/15/94	8/16/94	<50
20	RFI-6 (5-7)	8/10/94	8/15/94	8/16/94	<50
21	RFI-7 (4-6)	8/10/94	8/15/94	8/16/94	<50
22	RFI-7 (6-8)	8/10/94	8/15/94	8/16/94	<50
23	RFI-8 (4-6)	8/10/94	8/15/94	8/16/94	<50
24	RFI-8 (6-8)	8/10/94	8/15/94	8/16/94	<50
25	RFI-9 (4-6)	8/10/94	8/17/94	8/18/94	<50
26	RFI-9 (6-8)	8/10/94	8/17/94	8/18/94	<50
27	RFI-10 (4-6)	8/10/94	8/17/94	8/18/94	<50
28	RFI-10 (6-8)	8/10/94	8/17/94	8/18/94	<50
29	RFI-21 (10-12)	8/10/94	8/17/94	8/18/94	<50

ANALYTICAL REVIEW / DATE:

APPENDIX C-2

QA/QC SUMMARY DATA SHEETS

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

INITIAL CALIBRATION VERIFICATION
QC CHECK SAMPLE REPORT
Metals in TCLP Leachate

% Acceptability Limits: 90 - 110

Analyte	Date Analyzed	Expected Result µg/L	Observed Result µg/L	% Recovery
Mercury	8/22/94	2.5	2.56	102
	8/24/94	2.5	2.5	100

METHOD BLANK SUMMARY
Metals in TCLP Leachate

Lab Blank #:	RBlank3	RBlank5	RBlank4
Date Digested:	8/22/94	8/22/94	8/24/94
Date Analyzed:	8/22/94	8/22/94	8/24/94
Analyte	Concentration µg/L		
Mercury	<0.2	<0.2	<0.2

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

MATRIX SPIKE (MS) & MATRIX SPIKE DUPLICATE (MSD) SUMMARY

PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)

Metals in TCLP Leachate

Acceptability Limits %

RPD: 20

% Recovery: 80 - 120

Work Order #: E94-053-49

Collector's Sample #: BG-3 (18-20)

Analyte	Spike Added mg/L	Sample Conc. μg/L	MS Conc. μg/L	MSD Conc. μg/L	MS % Recovery	MSD % Recovery	RPD %
Mercury	2.5	0	2.38	2.39	95	96	0

Work Order #: E94-053-25

Collector's Sample #: RFI-9 (4-6)

Analyte	Spike Added mg/L	Sample Conc. μg/L	MS Conc. μg/L	MSD Conc. μg/L	MS % Recovery	MSD % Recovery	RPD %
Mercury	2.5	0	2.55	2.54	102	102	0

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

INITIAL CALIBRATION VERIFICATION
QC CHECK SAMPLE REPORT
Metals in TCLP Leachate

% Acceptability Limits: 90 - 110

Analyte	Date Analyzed	Expected Result mg/L	Observed Result mg/L	% Recovery
Barium	8/22/94	5	5.002	100
Chromium	8/22/94	5	5.025	101

Analyte	Date Analyzed	Expected Result mg/L	Observed Result mg/L	% Recovery
Barium	8/24/94	5	5.021	100
Chromium	8/24/94	5	5.032	101

METHOD BLANK SUMMARY
Metals in TCLP Leachate

Lab Blank #:	DB0823B
Date Digested:	8/23/94
Date Analyzed:	8/24/94
Analyte	**Concentration mg/L**
Barium	<0.02
Chromium	<0.04

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

LABORATORY CONTROL SAMPLE RESULTS

Metals in TCLP Leachate

% Acceptability Limits: 80 - 120

Lab Control Sample ID#: LCS823B

Analyte	Date Digested	Date Analyzed	Expected Result mg/L	Observed Result mg/L	% Recovery
Barium	8/23/94	8/24/94	2	1.859	93
Chromium	8/23/94	8/24/94	0.1	0.0973	97

Lab Control Sample ID#: LCS823A

Analyte	Date Digested	Date Analyzed	Expected Result mg/L	Observed Result mg/L	% Recovery
Barium	8/23/94	8/24/94	2	1.937	97
Chromium	8/23/94	8/24/94	0.1	0.1004	100

Lab Control Sample ID#: LCS818

Analyte	Date Digested	Date Analyzed	Expected Result mg/L	Observed Result mg/L	% Recovery
Barium	8/18/94	8/22/94	2	1.968	98
Chromium	8/18/94	8/22/94	0.1	0.0966	97

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

MATRIX SPIKE (MS) & MATRIX SPIKE DUPLICATE (MSD) SUMMARY

PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)

Metals in TCLP Leachate

Acceptability Limits %

RPD: 20

% Recovery: 80 - 120

Work Order #: E94-053-10

Collector's Sample #: RFI-2 (0-2)

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	MSD Conc. mg/L	MS % Recovery	MSD % Recovery	RPD %
Barium	2	0.9923	2.811	2.767	91	89	2
Chromium	0.1	0	0.0948	0.0944	95	94	0

Work Order #: E94-053-21

Collector's Sample #: RFI-7 (4-6)

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	MSD Conc. mg/L	MS % Recovery	MSD % Recovery	RPD %
Barium	2	0.2454	1.871	1.963	81	86	6
Chromium	0.1	0	0.0848	0.088	85	88	4

Work Order #: E94-053-25

Collector's Sample #: RFI-9 (4-6)

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	MSD Conc. mg/L	MS % Recovery	MSD % Recovery	RPD %
Barium	2	0.4278	2.041	2.083	81	83	3
Chromium	0.1	0	0.0872	0.0915	87	92	5

Work Order #: E94-053-45

Collector's Sample #: BG-3 (2-4)

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	MSD Conc. mg/L	MS % Recovery	MSD % Recovery	RPD %
Barium	2	0.9519	2.618	2.667	83	86	3
Chromium	0.1	0	0.1079	0.0986	108	99	9

Work Order #: E94-053-49

Collector's Sample #: BG-3 (18-20)

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	MSD Conc. mg/L	MS % Recovery	MSD % Recovery	RPD %
Barium	2	0.34	1.963	1.965	81	81	0
Chromium	0.1	0	0.088	0.0884	88	88	0

INITIAL CALIBRATION VERIFICATION
QC CHECK SAMPLE REPORT
Metals in TCLP Leachate

% Acceptability Limits: 90 - 110

Analyte	Date Analyzed	Expected Result µg/L	Observed Result µg/L	% Recovery
Arsenic	8/20/94	50	52.2	104
	8/24/94	50	48.6	97
	8/25/94	50	49.9	100
	8/27/94	50	51.2	102
Cadmium	8/22/94	5	4.88	98
	8/24/94	5	4.87	97
	8/26/94	5	4.72	94
	8/27/94	5	4.73	95
	8/29/94	5	5.4	108
Chromium	8/26/94	50	52.7	105
	8/29/94	50	49.9	100
	8/19/94	50	51.3	103
	8/24/94	50	50.1	100
Lead	8/25/94	10	9.8	98
	8/27/94	10	9.2	92
	8/29/94	10	10.3	103
	8/30/94	10	10.5	105
Selenium	8/26/94	50	50.5	101
	8/29/94	50	48.7	97
Silver	8/26/94	25	26.38	106
	8/27/94	25	24.56	98

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

METHOD BLANK SUMMARY

Metals in TCLP Leachate

Lab Blank #:	DB0818		DB0822BP1		DB0822BP2		DB0824		DB0829	
Date Digested:	8/18/94		8/22/94		8/22/94		8/24/94		29-Aug	
Analyte	Date Analyzed	Conc. µg/L	Date Analyzed	Conc. µg/L	Date Analyzed	Conc. µg/L	Date Analyzed	Conc. µg/L	Date Analyzed	Conc. µg/L
Arsenic	8/20/94	<12.5	8/24/94	<12.5	8/24/94	<12.5	8/26/94	<12.5	-	-
Cadmium	8/22/94	<0.4	8/24/94	<0.4	8/24/94	<0.4	8/26/94	<0.4	8/29/94	<0.4
Chromium	8/19/94	<8.31	8/24/94	<8.31	8/24/94	<8.31	8/26/94	<8.31	-	-
Lead	8/25/94	<3.08	8/25/94	<3.08	8/25/94	<3.08	8/29/94	<3.08	8/30/94	4.5*
Selenium	8/25/94	<9.03	8/25/94	<9.03	8/25/94	<9.03	-	-	-	-
Silver	8/26/94	<4.38	8/26/94	<4.38	-	-	-	-	-	-

* Lead value above PQL, but below reporting limit.

LABORATORY CONTROL SAMPLE RESULTS

Metals in TCLP Leachate

% Acceptability Limits: 80 - 120

Lab Control Sample ID#: LCS818

Analyte	Date Digested	Date Analyzed	Expected Result µg/L	Observed Result µg/L	% Recovery
Arsenic	8/18/94	8/20/94	50	49.4	99
Cadmium	8/18/94	8/22/94	5	4.77	95
Chromium	8/18/94	8/19/94	50	51.6	103
Lead	8/18/94	8/25/94	10	10	100
Selenium	8/18/94	8/26/94	50	54.9	110
Silver	8/18/94	8/26/94	25	27.96	112

Lab Control Sample ID#: LCS8221

Analyte	Date Digested	Date Analyzed	Expected Result µg/L	Observed Result µg/L	% Recovery
Arsenic	8/22/94	8/24/94	50	46.7	93
Cadmium	8/22/94	8/24/94	5	4.61	92
Chromium	8/22/94	8/24/94	50	60.5	121
Lead	8/22/94	8/25/94	10	10.4	104
Selenium	8/22/94	8/26/94	50	48.3	97
Silver	8/22/94	8/26/94	25	26.12	104

Lab Control Sample ID#: LCS8222

Analyte	Date Digested	Date Analyzed	Expected Result µg/L	Observed Result µg/L	% Recovery
Arsenic	8/22/94	8/24/94	50	52.2	104
Cadmium	8/22/94	8/24/94	5	4.58	92
Chromium	8/22/94	8/24/94	50	49.5	99
Lead	8/22/94	8/25/94	10	11.1	111
Selenium	8/22/94	8/29/94	50	47.4	95

LABORATORY CONTROL SAMPLE RESULTS

Metals in TCLP Leachate

% Acceptability Limits: 80 - 120

Lab Control Sample ID#: LCS824

Analyte	Date Digested	Date Analyzed	Expected Result µg/L	Observed Result µg/L	% Recovery
Arsenic	8/24/94	8/25/94	50	44.2	88
Cadmium	8/24/94	8/26/94	5	4.84	97
Chromium	8/24/94	8/26/94	50	50.4	101
Lead	8/24/94	8/27/94	10	9.1	91
Selenium	8/24/94	8/29/94	50	46.2	92

Lab Control Sample ID#: LCS829

Analyte	Date Digested	Date Analyzed	Expected Result µg/L	Observed Result µg/L	% Recovery
Lead	8/29/94	8/30/94	10	11.1	111

Lab Control Sample ID#: LCSA

Analyte	Date Digested	Date Analyzed	Expected Result µg/L	Observed Result µg/L	% Recovery
Cadmium		8/29/94	5	5.32	106

MATRIX SPIKE (MS) &
MATRIX SPIKE DUPLICATE (MSD) SUMMARY
PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)
Metals in TCLP Leachate

Acceptability Limits %

Analyte: Arsenic

RPD: 20

% Recovery: 80 - 120

Work Order #	Spike Added mg/L	Sample Conc. µg/L	MS Conc. µg/L	MSD Conc. µg/L	MS % Recovery	MSD % Recovery	RPD %
05	50	0.3	55.7	54.7	111	109	2
10	50	0.9	54.3	54.4	107	107	0
21	50	0	58.9	59.1	118	118	0
25	50	0.2	58.5	59.5	117	119	2
31	50	0	56.1	57.2	112	114	2
37	50	0.7	51.9	53.6	102	106	3
45	50	0.9	46.4	46.2	91	91	0
49	50	0	56.7	56.3	113	113	1
57	50	0	56.6	56.4	113	113	0

Analyte: Chromium

Work Order #	Spike Added mg/L	Sample Conc. µg/L	MS Conc. µg/L	MSD Conc. µg/L	MS % Recovery	MSD % Recovery	RPD %
05	50	11.3	56.4	62	90	101	12
31	50	0.7	52.3	52.6	103	104	1
37	50	4.6	55	56	101	103	2
57	50	4.3	55.2	60.7	102	113	10

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

MATRIX SPIKE (MS) &
MATRIX SPIKE DUPLICATE (MSD) SUMMARY
PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)
Metals in TCLP Leachate

Acceptability Limits %

Analyte: Cadmium

RPD: 20

% Recovery: 80 - 120

Work Order #	Spike Added mg/L	Sample Conc. µg/L	MS Conc. µg/L	MSD Conc. µg/L	MS % Recovery	MSD % Recovery	RPD %
05	5	8.36	12.96	13.1	92	95	3
10	5	0.29	4.91	4.81	92	90	2
21	5	1.49	5.89	6.09	88	92	4
31	5	1.61	5.8	6.03	84	88	5
37	5	2.88	7.01	7.09	83	84	2
45	5	0.19	5.02	4.86	97	93	3
49	5	1.07	5.49	5.57	88	90	2
57	5	1.25	5.58	5.72	87	89	3
25R	5	1.43	5.88	5.96	89	91	2

Analyte: Lead

Work Order #	Spike Added mg/L	Sample Conc. µg/L	MS Conc. µg/L	MSD Conc. µg/L	MS % Recovery	MSD % Recovery	RPD %
05	10	0	8.6	8.2	86	82	5
10	10	0	8.5	7.6	85	76*	11
21	10	0.7	10.9	11.3	102	106	4
25	10	0.3	10.2	8.8	99	85	15
37	10	0	11.1	10.4	111	104	7
45	10	0	9.2	7.8	92	78*	16
49	10	0.6	9.4	10.1	88	95	8
57	10	0	8.6	8.2	86	82	5
31R	10	0	9.5	10.2	95	102	7

* Low recovery due to matrix effect confirmed by redigestion.

MATRIX SPIKE (MS) &
MATRIX SPIKE DUPLICATE (MSD) SUMMARY
PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)
Metals in TCLP Leachate

Acceptability Limits %
RPD: 20
% Recovery: 80 - 120

Analyte: Selenium

Work Order #	Spike Added mg/L	Sample Conc. µg/L	MS Conc. µg/L	MSD Conc. µg/L	MS % Recovery	MSD % Recovery	RPD %
10	50	0	44.4	44.1	89	88	1
21	50	0	46.8	46.2	94	92	1
25	50	0	42	40.8	84	82	3
45	50	0.5	52.2	52.5	103	104	1
49	50	0.1	46.2	46.8	92	93	1

Analyte: Silver

Work Order #	Spike Added mg/L	Sample Conc. µg/L	MS Conc. µg/L	MSD Conc. µg/L	MS % Recovery	MSD % Recovery	RPD %
10	25	0	21.8	21.2	87	85	3
21	25	0.1	21.1	21.1	84	84	0
25	25	0.15	23.79	21.8	95	87	9
45	25	0.12	20.5	20.6	82	82	0
49	25	0.08	20.7	20.75	82	83	0

Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

SURROGATE RECOVERY SUMMARY

Semi-Volatile Organics in Soil

EPA Method 8270

4-Methylphenol

Work Order #	Collector's Sample #	Percent Recovery		
		S1 (PHL)	S2 (2FP)	TOTAL OUT
01	EOD-1(12-14)	57	55	0
02	EOD-3 (10-12)	70	81	0
03	EOD-3 (32-34)	61	51	0
04	EOD-4 (10-12)	45	85	0
05	EOD-4(17.5-19.5)	58	51	0
06	EOD-5 (13-15)	72	85	0
07	EOD-5 (32-34)	58	67	0
08	RFI-1 (2-4)	56	64	0
09	RFI-1 (4-6)	54	64	0
10	RFI-2 (0-2)	85	90	0
11	RFI-2 (2-4)	92	122	1
12	RFI-3 (0-2)	87	118	0
13	RFI-3 (0-2)	76	83	0
14	RFI-4 (0-2)	77	86	0
15	RFI-4 (2-4)	69	72	0
16	RFI-20 (6-8)	80	89	0
17	RFI-5 (3-5)	57	44	0
18	RFI-5 (5-7)	48	35	0
19	RFI-6 (3-5)	39	37	0
20	RFI-6 (5-7)	62	43	0
21	RFI-7 (4-6)	51	42	0
22	RFI-7 (6-8)	52	43	0
23	RFI-8 (4-6)	52	46	0
24	RFI-8 (6-8)	60	52	0
25	RFI-9 (4-6)	38	34	0

Project ID #: 44-02

Project ID Name: SK - Pekin

SK Lab Project #: 94-053

Date Reported: 12/1/94

SURROGATE RECOVERY SUMMARY

Semi-Volatile Organics in Soil

EPA Method 8270

4-Methylphenol

Work Order #	Collector's Sample #	Percent Recovery		
		S1 (PHL)	S2 (2FP)	TOTAL OUT
26	RFI-9 (6-8)	66	79	0
27	RFI-10 (4-6)	64	72	0
28	RFI-10 (6-8)	88	98	0
29	RFI-21 (10-12)	74	72	0
30	EOD-6 (0.5-2.5)	89	140	1
31	EOD-6 (15.5-17.5)	85	97	0
32	EOD-6 (34-36)	64	67	0
33	EOD-7 (13-15)	99	83	0
34	EOD-7 (34-36)	39	41	0
35	EOD-8 (13-15)	62	66	0
36	EOD-8 (34-36)	83	90	0
37	EOD-9 (34-36)	83	89	0
38	EOD-10 (13-15)	89	98	0
39	EOD-10 (34-36)	111	102	0
40	EOD-2A (5.5-7.5)	45	31	0
41	EOD-2A (34-36)	47	33	0

	Surrogates		Recovery Limits
S1	PHL	Phenol-d5	24 - 113
S2	2FP	2-Fluorophenol	25 - 121

Review / Date:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

METHOD BLANK SUMMARY

Semi-Volatile Organics in Soil

EPA Method 8270

Analyte: 4-Methylphenol

Lab Blank #	Date Extracted	Date Analyzed	Concentration mg/Kg
EBLK0812	8/12/94	8/17/94	<0.060
EBLK0815	8/15/94	8/17/94	<0.060
EBLK0816	8/16/94	8/18/94	<0.060
EBLK0817	8/17/94	8/23/94	<0.060
EBLK0818	8/18/94	8/22/94	<0.060
EBLK0824	8/24/94	8/25/94	<0.060

Review / Date:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

MATRIX SPIKE (MS) & MATRIX SPIKE DUPLICATE (MSD) SUMMARY

PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)

Semi-Volatile Organics in Soil

EPA Method 8270

Acceptability Limits %

Work Order #: E94-053-01 RPD: 20

Collector's Sample #: EOD-1 (12-14) % Recovery: 27 - 120

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %
Phenol 5-112	80	<66	60.8	65.4	76	82	7
2-Chlorophenol 23-134	80	<66	48.4	55.2	61	69	13
1,4-Dichlorobenzene 20-124	80	<66	42.8	52.6	54	66	21
N-Nitrosodinpropylamine D-230	80	<66	50.2	56	63	70	11
1,2,4-Trichlorobenzene 44-142	80	<66	39.2	46.9	49	59	18
4-Chloro-3-Methylphenol 22-147	80	<66	71.5	65.1	89	81	9
Acenaphthene 47-145	80	<66	53.4	53.3	67	67	0
4-Nitrophenol D-132	80	<66	9.6	13	12	16	30
2,4-Dinitrotoluene 39-139	80	<66	48.8	42.6	61	53	14
Pentachlorophenol 14-176	80	<66	3.6	0	5	0	200
Pyrene 52-115	80	<66	46.2	45.1	58	56	2

Project ID Name: SK - Pekin

SK Lab Project #: 94-053

Date Reported: 12/1/94

MATRIX SPIKE (MS) & MATRIX SPIKE DUPLICATE (MSD) SUMMARY

PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)

Semi-Volatile Organics in Soil

EPA Method 8270

Acceptability Limits %

Work Order #: E94-053-13

RPD: 20

Collector's Sample #: RFI-3 (0-2)

% Recovery: 27 - 120

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %
Phenol	80	<66	69.3	73.1	87	91	5
2-Chlorophenol	80	<66	67.5	71.4	84	89	6
1,4-Dichlorobenzene	80	<66	56.8	60	71	75	5
N-Nitrosodinpropylamine	80	<66	67.5	69.1	84	86	2
1,2,4-Trichlorobenzene	80	<66	76.5	78	96	98	2
4-Chloro-3-Methylphenol	80	<66	81.6	82.8	102	104	1
Acenaphthene	80	<66	67.8	69.4	85	87	2
4-Nitrophenol	80	<66	59.3	61.8	74	77	4
2,4-Dinitrotoluene	80	<66	63	62.7	79	78	0
Pentachlorophenol	80	<66	69.3	71.1	87	89	3
Pyrene	80	<66	69.8	71.3	87	89	2

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

MATRIX SPIKE (MS) & MATRIX SPIKE DUPLICATE (MSD) SUMMARY

PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)

Semi-Volatile Organics in Soil

EPA Method 8270

Acceptability Limits %

Work Order #: E94-053-24 RPD: 20

Collector's Sample #: RFI-8 (6-8) % Recovery: 27 - 120

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %
Phenol	80	<66	52.4	54.3	66	68	3
2-Chlorophenol	80	<66	44.2	46.2	55	58	4
1,4-Dichlorobenzene	80	<66	26	24.7	33	31	5
N-Nitrosodinpropylamine	80	<66	51.6	61.8	65	77	18
1,2,4-Trichlorobenzene	80	<66	36	33.8	45	42	6
4-Chloro-3-Methylphenol	80	<66	64	63.9	80	80	0
Acenaphthene	80	<66	49.7	48.4	62	61	3
4-Nitrophenol	80	<66	37.2	39.3	47	49	5
2,4-Dinitrotoluene	80	<66	51.8	49.9	65	62	4
Pentachlorophenol	80	<66	65.2	60.2	82	75	8
Pyrene	80	<66	46.8	61.4	59	77	27

MATRIX SPIKE (MS) &
MATRIX SPIKE DUPLICATE (MSD) SUMMARY

PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)

Semi-Volatile Organics in Soil

EPA Method 8270

Acceptability Limits %

Work Order #: E94-053-28R RPD: 20

Collector's Sample #: % Recovery: 27 - 120

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %
Phenol	80	<66	71.4	60	89	75	18
2-Chlorophenol	80	<66	67.2	55.7	84	70	19
1,4-Dichlorobenzene	80	<66	55.3	49.8	69	62	10
N-Nitrosodinpropylamine	80	<66	79.2	72	99	90	10
1,2,4-Trichlorobenzene	80	<66	56.2	51.5	70	64	9
4-Chloro-3-Methylphenol	80	<66	68.1	57.7	85	72	17
Acenaphthene	80	<66	62.7	57.4	78	72	9
4-Nitrophenol	80	<66	73.1	61	91	76	18
2,4-Dinitrotoluene	80	<66	58.8	52.1	74	65	12
Pentachlorophenol	80	<66	95	81.2	119	102	16
Pyrene	80	<66	47.4	43.3	59	54	9

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

MATRIX SPIKE (MS) &
MATRIX SPIKE DUPLICATE (MSD) SUMMARY
PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)
Semi-Volatile Organics in Soil

EPA Method 8270

Acceptability Limits %

Work Order #: E94-053-32R RPD: 20

Collector's Sample #: % Recovery: 27 - 120

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %
Phenol	80	<66	64.8	62.1	81	78	4
2-Chlorophenol	80	<66	67.2	51.2	84	64	27
1,4-Dichlorobenzene	80	<66	23.4	16	29	20	38
N-Nitrosodinpropylamine	80	<66	79.7	79.1	100	99	1
1,2,4-Trichlorobenzene	80	<66	36.8	25.3	46	32	37
4-Chloro-3-Methylphenol	80	<66	67.5	68	84	85	1
Acenaphthene	80	<66	57.8	56.4	72	71	2
4-Nitrophenol	80	<66	44.9	50.8	56	64	12
2,4-Dinitrotoluene	80	<66	42.8	31.3	54	39	31
Pentachlorophenol	80	<66	57.7	59.6	72	75	3
Pyrene	80	<66	62.7	63.2	78	79	1

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

MATRIX SPIKE (MS) & MATRIX SPIKE DUPLICATE (MSD) SUMMARY

PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)

Semi-Volatile Organics in Soil

EPA Method 8270

Acceptability Limits %

Work Order #: E94-053-41 RPD: 20

Collector's Sample #: EOD-2A (34-36) % Recovery: 27 - 120

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %
henol	80	<66	44.3	44.6	55	56	0
2-Chlorophenol	80	<66	30.7	27.5	38	34	11
1,4-Dichlorobenzene	80	<66	16.9	13.7	21	17	21
N-Nitrosodinpropylamine	80	<66	68.8	86.8	86	109	23
1,2,4-Trichlorobenzene	80	<66	41.5	30.5	52	38	31
4-Chloro-3-Methylphenol	80	<66	58.5	59.9	73	75	2
Acenaphthene	80	<66	54	53.9	68	67	0
4-Nitrophenol	80	<66	8.4	15.2	11	19	58
2,4-Dinitrotoluene	80	<66	32.1	28.4	40	36	12
Pentachlorophenol	80	<66	34.3	44.8	43	56	27
Pyrene	80	<66	57.7	48.9	72	61	17

Review / Date:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

SURROGATE RECOVERY SUMMARY

Volatile Organics in Soil

EPA Method 8240

Work Order #	Collector's Sample #	Percent Recovery			
		S1 (TOL)	S2 (BFB)	S3 (DCE)	TOTAL OUT
01	EOD-1(12-14)	102	96	105	0
02	EOD-3 (10-12)	100	110	114	0
03	EOD-3 (32-34)	103	93	102	0
04	EOD-4 (10-12)	102	104	84	0
05	EOD-4(17.5-19.5)	106	91	116	0
06	EOD-5 (13-15)	102	95	103	0
07	EOD-5 (32-34)	103	95	101	0
08	RFI-1 (2-4)	104	89	102	0
09	RFI-1 (4-6)	101	96	105	0
10	RFI-2 (0-2)	89	84	116	0
11	RFI-2 (2-4)	103	94	116	0
12	RFI-3 (0-2)	102	95	101	0
13	RFI-3 (0-2)	102	102	102	0
14	RFI-4 (0-2)	108	98	109	0
15	RFI-4 (2-4)	106	97	107	0
16	RFI-20 (6-8)	89	70	84	1
17	RFI-5 (3-5)	106	98	104	0
18	RFI-5 (5-7)	97	100	119	0
19	RFI-6 (3-5)	103	100	108	0
20	RFI-6 (5-7)	92	110	105	0
21	RFI-7 (4-6)	110	95	113	0
22	RFI-7 (6-8)	113	92	119	0
23	RFI-8 (4-6)	96	90	102	0
24	RFI-8 (6-8)	105	101	108	0
25	RFI-9 (4-6)	108	87	114	0

Project ID #:	44-02
Project ID Name:	SK - Pekin
SK Lab Project #:	94-053
Date Reported:	12/1/94

SURROGATE RECOVERY SUMMARY

Volatile Organics in Soil

EPA Method 8240

Work Order #	Collector's Sample #	Percent Recovery			
		S1 (TOL)	S2 (BFB)	S3 (DCE)	TOTAL OUT
26	RFI-9 (6-8)	102	93	110	0
27	RFI-10 (4-6)	104	93	101	0
28	RFI-10 (6-8)	101	97	97	0
29	RFI-21 (10-12)	105	93	106	0
30	EOD-6 (0.5-2.5)	100	98	120	0
31	EOD-6 (15.5-17.5)	102	99	100	0
32	EOD-6 (34-36)	103	111	102	0
33	EOD-7 (13-15)	100	100	114	0
34	EOD-7 (34-36)	104	97	117	0
35	EOD-8 (13-15)	100	105	92	0
36	EOD-8 (34-36)	101	95	121	0
37	EOD-9 (34-36)	99	99	120	0
38	EOD-10 (13-15)	97	82	102	0
39	EOD-10 (34-36)	108	91	118	0
40	EOD-2A (5.5-7.5)	99	102	105	0
41	EOD-2A (34-36)	101	95	103	0

		Recovery Limits
TOL	Toluene-d8	81 - 117
BFB	Bromofluorobenzene	74 - 121
DCE	1,2-Dichloroethane-d4	70 - 121

Review / Date:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

METHOD BLANK SUMMARY

Volatile Organics in Soil

EPA Method 8240

Lab Blank #	Method Blank	Method Blank	Method Blank	Method Blank	Method Blank	Method Blank
Date Analyzed	8/15/94	8/16/94	8/17/94	8/18/94	8/19/94	8/26/94
Analyte	Concentration mg/Kg					
Acetone	<.005	<.005	<.005	<.005	<.005	<.005
Benzene	<.005	<.005	<.005	<.005	<.005	<.005
Chlorobenzene	<.005	<.005	<.005	<.005	<.005	<.005
1,1-Dichloroethane	<.005	<.005	<.005	<.005	<.005	<.005
1,2-Dichloroethane	<.005	<.005	<.005	<.005	<.005	<.005
1,1-Dichloroethylene	<.005	<.005	<.005	<.005	<.005	<.005
cis-1,2-Dichloroethylene	<.005	<.005	<.005	<.005	<.005	<.005
trans-1,2-Dichloroethylene	<.005	<.005	<.005	<.005	<.005	<.005
Ethylbenzene	<.005	<.005	<.005	<.005	<.005	<.005
Tetrachloroethylene	<.005	<.005	<.005	<.005	<.005	<.005
Toluene	<.005	<.005	<.005	<.005	<.005	<.005
1,1,1-Trichloroethane	<.005	<.005	<.005	<.005	<.005	<.005
Trichloroethylene	<.005	<.005	<.005	<.005	<.005	<.005
Vinyl Chloride	<.005	<.005	<.005	<.005	<.005	<.005
Xylenes	<.005	<.005	<.005	<.005	<.005	<.005

Review / Date:

MATRIX SPIKE (MS) & MATRIX SPIKE DUPLICATE (MSD) SUMMARY

PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)

Volatile Organics in Soil

EPA Method 8240

Work Order #: 94-053-08

Collector's Sample #: RFI-1 (2-4)

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %	Acceptability Limits %	
								RPD	% Recovery
Benzene	0.050	<.005	0.0487	0.047	97	94	4	20	76 - 127
Chlorobenzene	0.050	<.005	0.0426	0.0408	85	82	4	20	75 - 110
1,1-Dichloroethylene	0.050	<.005	0.0572	0.0538	114	108	6	20	61 - 145
Toluene	0.050	<.005	0.0469	0.0444	94	89	5	20	76 - 125
Trichloroethylene	0.050	<.005	0.0449	0.0425	90	85	5	20	71 - 120

Work Order #: 94-053-13

Collector's Sample #: RFI-3 (0-2)

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %	Acceptability Limits %	
								RPD	% Recovery
Benzene	0.050	<.005	0.0507	0.0487	101	97	4	20	76 - 127
Chlorobenzene	0.050	<.005	.0512	0.0493	102	99	4	20	75 - 110
1,1-Dichloroethylene	0.050	<.005	0.056	0.054	112	108	4	20	61 - 145
Toluene	0.050	<.005	0.052	0.05	104	100	4	20	76 - 125
Trichloroethylene	0.050	<.005	0.048	0.0475	96	95	1	20	71 - 120

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

MATRIX SPIKE (MS) & MATRIX SPIKE DUPLICATE (MSD) SUMMARY

PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)

Volatile Organics in Soil

EPA Method 8240

Work Order #: 94-053-27

Collector's Sample #: RFI-10 (4-6)

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %	Acceptability Limits %	
								RPD	% Recovery
Benzene	0.050	<.005	0.0499	0.052	100	104	4	20	76 - 127
Chlorobenzene	0.050	<.005	0.0481	0.0508	96	102	5	20	75 - 110
1,1-Dichloroethylene	0.050	<.005	0.0549	0.0563	110	113	3	20	61 - 145
Toluene	0.050	<.005	0.0504	0.0523	101	105	3	20	76 - 125
Trichloroethylene	0.050	<.005	0.0478	0.0494	96	99	3	20	71 - 120

Work Order #: 94-053-29

Collector's Sample #: RFI-21 (10-12)

Analyte	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %	Acceptability Limits %	
								RPD	% Recovery
Benzene	0.050	<.005	0.0502	0.0521	100	104	4	20	76 - 127
Chlorobenzene	0.050	<.005	0.048	0.0497	96	99	3	20	75 - 110
1,1-Dichloroethylene	0.050	<.005	0.055	0.06	110	120	9	20	61 - 145
Toluene	0.050	<.005	0.0521	0.0554	104	111	6	20	76 - 125
Trichloroethylene	0.050	<.005	0.0442	0.0449	88	90	2	20	71 - 120

ew / Date:

SURROGATE COMPOUND RECOVERY

o-Terphenyl

Total Petroleum Hydrocarbons as Mineral Spirits in Soil

Modified EPA Method 8015

Acceptability Limits: 80 - 146

Work Order #	Collector's Sample #	Surrogate Recovery %
01	EOD-1(12-14)	88
02	EOD-3 (10-12)	91
03	EOD-3 (32-34)	95
04	EOD-4 (10-12)	93
05	EOD-4(17.5-19.5)	93
06	EOD-5 (13-15)	92
07	EOD-5 (32-34)	102
09	RFI-1 (4-6)	94
11	RFI-2 (2-4)	84
17	RFI-5 (3-5)	93
18	RFI-5 (5-7)	97
19	RFI-6 (3-5)	94
20	RFI-6 (5-7)	102
21	RFI-7 (4-6)	95
22	RFI-7 (6-8)	94
23	RFI-8 (4-6)	96
24	RFI-8 (6-8)	96
25	RFI-9 (4-6)	91
26	RFI-9 (6-8)	104
27	RFI-10 (4-6)	85
28	RFI-10 (6-8)	89
29	RFI-21 (10-12)	98

Project ID #: 44-02 TPH
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

SURROGATE COMPOUND RECOVERY

o-Terphenyl

Total Petroleum Hydrocarbons as Mineral Spirits in Soil

Modified EPA Method 8015

Acceptability Limits: 80 - 146

Work Order #	Collector's Sample #	Surrogate Recovery %
30	EOD-6 (0.5-2.5)	108
31	EOD-6 (15.5-17.5)	109
32	EOD-6 (34-36)	109
33	EOD-7 (13-15)	115
34	EOD-7 (34-36)	103
35	EOD-8 (13-15)	105
36	EOD-8 (34-36)	107
37	EOD-9 (34-36)	80
38	EOD-10 (13-15)	109
39	EOD-10 (34-36)	107
40	EOD-2A (5.5-7.5)	107
41	EOD-2A (34-36)	116

Review / Date:

Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

METHOD BLANK SUMMARY

Total Petroleum Hydrocarbons as Mineral Spirits in Soil

Modified EPA Method 8015

Analyte: SK-105

Lab Blank #	Date Extracted	Date Analyzed	Concentration mg/Kg
BLK0815	8/15/94	8/15/94	<2.678
BLK0815A	8/15/94	8/16/94	<2.678
BLK0817	8/17/94	8/18/94	<2.678

Review / Date:

Project ID #: 44-02
Project ID Name: SK - Pekin
SK Lab Project #: 94-053
Date Reported: 12/1/94

MATRIX SPIKE (MS) &
MATRIX SPIKE DUPLICATE (MSD) SUMMARY
PERCENT RECOVERY & RELATIVE PERCENT DIFFERENCE (RPD)
Total Petroleum Hydrocarbons as Mineral Spirits in Soil

Modified EPA Method 8015

Acceptability Limits %

RPD: 25

Analyte: SK-105

% Recovery: 80 - 146

Work Order #	Collector's Sample #	Spike Added mg/Kg	Sample Conc. mg/Kg	MS Conc. mg/Kg	MSD Conc. mg/Kg	MS % Recovery	MSD % Recovery	RPD %
07	EOD-5 (32-34)	30.1	0.45	26.33	27.2	86	89	3
09	RFI-1 (4-6)	30.1	0.37	24.59	25.28	80	83	3
39	EOD-10 (34-36)	30.1	0.42	27.44	27.32	90	89	0

Review / Date:

APPENDIX C-3

CHAIN-OF-CUSTODY/SAMPLE-ANALYSIS REQUEST FORMS

SK PEKIN - RFI AND EOD CHAIN-OF CUSTODY RECORD

Project No.:	Today's Date:	Date Results Requested:
44-01	8/10/94	STANDARD T-A-T

Sampler's Name:	Phone No.:	Fax No.:
Tom Nissen CHARLIE DEWOLF	307-745-7474	307-745-7729

Company Name and Address:	Company Contact:
TriHydro Corporation 410 Grand Avenue Laramie, WY 82070	T. NISSEN C. DEWOLF J. BEDESSEM

Analyses Requested

	Collector's Sample No.	Sample Matrix	Date Sampled/ Time Sampled	No. of Containers	MINERAL SPIRITS (8015)	RFI TARGET VOCs (8240)	EOD TARGET VOCs (8240)	RFI TARGET SVOCs (8270)	EOD TARGET SVOCs (8270)	TCLP ARSENIC [1,2]	" BARIUM [1]	" CADMIUM [1,2]	" CHROMIUM [1,2]	" LEAD [1,2]	" MERCURY [1]	" SELENIUM [1]	" SILVER [1]							
08	RFI-1(2-4)	SOIL	8/10/94 0720	2 BRASS 1 GLASS		X		X		X	X	X	X	X	X	X	X							
09	RFI-1(4-6)	↓	8/10/94 0725	↓	X	X	X	X	X	X	X	X	X	X	X	X	X							
10	RFI-2(0-2)		8/10/94 0755			X		X		X	X	X	X	X	X	X	X							
11	RFI-2(2-4)		8/10/94 0800		X	X	X	X	X	X	X	X	X	X	X	X	X							
12	RFI-3(0-2)		8/10/94 0825			X		X		X	X	X	X	X	X	X	X							
13	RFI-3(2-4)		8/10/94 0830			X		X		X	X	X	X	X	X	X	X							
14	RFI-4(0-2)		8/10/94 0845			X		X		X	X	X	X	X	X	X	X							
15	RFI-4(2-4)	↓	8/10/94 0850	↓		X		X		X	X	X	X	X	X	X	X							

Remarks: REFER TO 7-PAGE RFI ATTACHMENT AND 2-PAGE EOD ATTACHMENT FOR TARGET CONSTITUENT LISTS, REQ'D REPORTING LIMITS, METHODS, AND HOLDING TIMES. DO NOT BE CONFUSED -- TWO OF THE ABOVE SAMPLES ARE BEING USED TO SATISFY REQUIREMENTS OF THE RFI AND EOD; DO NOT DOUBLE ANALYZE, BUT REPORT RESULTS SPECIFIC FOR EACH PROGRAM SEPARATELY
NOTES: (1) USE EITHER AA OR ICP AS NECESSARY TO ACHIEVE TARGET LEVELS
(2) REPORT ONLY 4 METALS FOOTNOTED WITH "2" FOR THE EOD, ALL 8 FOR THE RFI BILL B. SCHOEPKE AUTH ~~#E10741~~ E 10741

Relinquished by:	Affiliation:	Date/Time:	Received by:	Affiliation:	Date/Time:
Thomas C. Nissen	TRIHYDRO	8/11/94 1610	Matt Schmid	Teel	8/12/94 11:30
Relinquished by:	Affiliation:	Date/Time:	Received by:	Affiliation:	Date/Time:
Relinquished by:	Affiliation:	Date/Time:	Received by:	Affiliation:	Date/Time:

Were samples received in good condition?	Remarks:
BC	

S-K PEKIN RFI ONLY CHAIN-O[illegible]ODY RECORD Page 2 1R

Project No.:	Today's Date:	Date Results Requested:
44-01	8/10/94	STANDARD T-A-T

Sampler's Name:	Phone No.:	Fax No.:
TOM NISSEN CHARLIE DEWOLF	307-745-7474	307-745-7729

Company Name and Address:	Company Contact:
TriHydro Corporation 410 Grand Avenue Laramie, WY 82070	T. NISSEN C. DEWOLF J. BEDESSEM

Analyses Requested

	Collector's Sample No.	Sample Matrix	Date Sampled/ Time Sampled	No. of Containers	MINERAL SPIRITS (8015)	RFI TARGET VOCs (8240)	RFI TARGET SVOCs (8270)	TCLP ARSENIC ①	" BARIUM ①	" CADMIUM ①	" CHROMIUM ①	" LEAD ①	" MERCURY ①	" SELENIUM ①	" SILVER ①
16 ✓	RFI-20(6-8)	SOIL	8/10/94 0905	2 BRASS 1 GLASS		X	X	X	X	X	X	X	X	X	X
17 ✓	RFI-5 (3-5)	↓	8/10/94 1420	↓	X	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
18 ✓	RFI-5 (5-7)	↓	8/10/94 1425	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
19 ✓	RFI-6 (3-5)	↓	8/10/94 1500	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
20 ✓	RFI-6 (5-7)	↓	8/10/94 1505	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
21 ✓	RFI-7(4-6)	↓	8/10/94 1540	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
22 ✓	RFI-7(6-8)	↓	8/10/94 1545	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
23 ✓	RFI-8 (4-6)	↓	8/10/94 1610	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Remarks: REFER TO 7-PAGE RFI ATTACHMENT FOR TARGET CONSTITUENT LISTS, REQUIRED REPORTING LIMITS, METHODS, AND HOLDING TIMES. SAMPLES ON THIS SHEET ARE TO BE ANALYZED FOR THE RFI ONLY
① RUN BY AA OR ICP ON TCLP EXTRACT TO ACHIEVE REQUIRED CONCENTRATION LEVELS.
BILL B. SCHOEPKE AUTH #E10741

Relinquished by:	Affiliation:	Date/Time:	Received by:	Affiliation:	Date/Time:
Thomas C. Nissen	TRIHYDRO	8/11/94 1610	[signature]	Teel	8/12/94 11:30
Relinquished by:	Affiliation:	Date/Time:	Received by:	Affiliation:	Date/Time:
Relinquished by:	Affiliation:	Date/Time:	Received by:	Affiliation:	Date/Time:

Were samples received in good condition?	Remarks:
OK	

S-K PEKIN RFI ONLY

CHAIN-O[F CUST]ODY RECORD

Project No.:	Today's Date:	Date Results Requested:
44-01	8/10/94	STANDARD T-A-T

Sampler's Name:	Phone No.:	Fax No.:
TOM NISSEN CHARLIE DEWOLF	307-745-7474	307-745-7729

Company Name and Address:	Company Contact:
TriHydro Corporation 410 Grand Avenue Laramie, WY 82070	T. NISSEN C. DEWOLF J. BEDESSEM

Analyses Requested

	Collector's Sample No.	Sample Matrix	Date Sampled/ Time Sampled	No. of Containers	MINERAL SPIRITS (8015)	RFI TARGET VOCs (8240)	RFI TARGET SVOCs (8270)	TCLP ARSENIC	TCLP BARIUM	TCLP CADMIUM	TCLP CHROMIUM	TCLP LEAD	TCLP MERCURY	TCLP SELENIUM	TCLP SILVER
24 ✓	RFI-8 (6-8) ✓	SOIL	8/10/94 1625	2 BRASS 1 GLASS	X	X	X	X	X	X	X	X	X	X	X
25 ✓	RFI-9 (4-6) ✓	↓	8/10/94 1640	2 BRASS RINGS	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
26 ✓	RFI-9 (6-8) ✓	↓	8/10/94 1645	2 BRASS 1 GLASS	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
27	RFI-10 (4-6) ✓	↓	8/10/94 1740	2 BRASS RINGS	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
28	RFI-10 (6-8) ✓	↓	8/10/94 1745	2 BRASS RINGS	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
29 ✓	RFI-21 (10-12) ✓	↓	8/10/94 1730	1 BRASS RING 1 Glass JAR	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Remarks: SEE NOTES ON PREVIOUS PAGE (PAGE 2 OF 12)

Relinquished by:	Affiliation:	Date/Time:	Received by:	Affiliation:	Date/Time:
Thomas [signature]	TRIHYDRO	8/11/94 1610	Matt [signature]	Tech	8/12/94 11:30
Relinquished by:	Affiliation:	Date/Time:	Received by:	Affiliation:	Date/Time:
Relinquished by:	Affiliation:	Date/Time:	Received by:	Affiliation:	Date/Time:

Were samples received in good condition?	Remarks:

APPENDIX D

QUALITY ASSURANCE PROJECT REPORT
RFI PHASE I RELEASE ASSESSMENT
PEKIN SERVICE CENTER

D-1 QUALIFICATIONS OF PROJECT TEAM MEMBERS

D-2 FIELD AUDIT RESULTS

D-3 SAFETY-KLEEN ENVIRONMENTAL LABORATORY STANDARD OPERATING PROCEDURE FOR TPH ANALYSES

APPENDIX D

QUALITY ASSURANCE PROJECT REPORT (QuAPR)

Introduction

This Quality Assurance Project Report contains the quality assurance/quality control (QA/QC) evaluations of the investigative (RFI) data collected during the Phase I RCRA Facility Investigation at the Safety-Kleen Service Center in Pekin, Illinois. The evaluations were conducted to ensure that the investigative data are sufficiently precise, accurate, representative, and complete to achieve the RFI project objectives. The evaluations were performed in accordance with the RCRA Facility Investigation Quality Assurance Project Plan (QuAPjP), which was included as Part V of the RFI Workplan.

Project Description

The purpose of the Phase I RFI at the Safety-Kleen Service Center in Pekin, Illinois was to determine whether a release of hazardous constituents had occurred from the two solid waste management units (SWMUs) and area of concern (AOC) under consideration. The investigation involved a single sampling event which consisted of the collection and field screening (for total organic vapors and total petroleum hydrocarbons) of soil samples at ten locations in the vicinities of the SWMUs and AOC. Twenty soil samples were submitted for laboratory analysis of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), Total Petroleum Hydrocarbons as Mineral Spirits (TPH), and eight RCRA metals. The laboratory results were used to determine whether a release had occurred from the units under investigation.

Quality Assurance Evaluations

The quality assurance objectives provide quantitative and qualitative measures of the ability to produce high-quality results through a properly designed sampling and analysis program. The objectives of the overall quality assurance/quality control (QA/QC) program were to:

- Ensure that all procedures were documented, including any changes from the Workplan protocol.
- Ensure that all sampling and analytical procedures were conducted according to sound scientific principles.

- Monitor the performance of the field sampling team and laboratory with a systematic audit program and provide for corrective action necessary to assure quality.

- Evaluate the quality of the analytical data through a system of quantitative and qualitative criteria.

- Ensure that all data and observations are properly recorded and archived.

The degree to which these objectives were satisfied during the performance of the RFI is discussed below. This analysis is divided into the following:

1. Field Procedures Quality Control Evaluation

2. Laboratory Data Quality Control Evaluation (for method Detection Limits, Accuracy, Precision, and Completeness)

3. Overall Evaluation of Data Representativeness and Comparability

Field Procedures Quality Control Evaluation

Quality control during the field procedures was attained through:

- Compliance with the Workplan as approved with conditions by the Illinois Environmental Protection Agency (IEPA);

- Use of a qualified and experienced field team;

- Proper recording and archiving of all field data;

- Documentation of any changes from the Workplan in daily field memoranda, field audit reports, and in quarterly progress reports to IEPA;

- Monitoring of field procedures by IEPA and Safety-Kleen representatives; and

- A systematic audit of field activities.

The field procedures are described in Part IV of the RFI Workplan and Chapter II of this document. The RFI was conducted in accordance with the Workplan as approved with conditions by IEPA, except that:

- Four borings were installed adjacent to the warehouse trench (SWMU #13) rather than three in the trench as specified by the Workplan. The change was made in order to maintain the integrity of the trench, which is a secondary containment structure in an operating drum storage area. The change was approved in the field by the IEPA representatives.

- An additional boring was constructed to the south of AOC#16 in order to estimate the extent of native soil removed in this area. No additional samples were submitted to the laboratory.

- Background samples were collected during the Phase I sampling event after the extent of impacts had been determined based on field screening results, but before laboratory results on the investigative samples had been obtained. Subsequently, laboratory data confirmed that the areas sampled as background were not impacted by facility-related activities.

The results of these changes were to increase the amount of information acquired during the RFI and improve the interpretation of the data.

The project management structure is presented on Figure D-1. The minor changes in management structure from that proposed in the RFI Workplan are indicated on Figure D-1. These changes increased the expertise and experience levels of the project team beyond those proposed in the Workplan. Qualifications of the project team members are presented in Appendix D-1.

Field data are complete with respect to the Workplan requirements. They are archived as Appendix B of this report. The few changes from the Workplan procedures were discussed with IEPA representatives in the field prior to implementation, and the deviations are documented in the quarterly report (dated October 24, 1994) and in this Phase I report.

IEPA representatives Greg Sanders and Ron Mehalic, and Safety-Kleen representative Bob Schoepke were present during the collection of samples for an Extent of Degradation Investigation conducted immediately prior to the RFI. The same sample collection procedures were used for both investigations. A field audit was performed by Jack Bedessem of TriHydro Corporation. The results of the field audit are presented in Appendix D-2.

Laboratory Data Quality Control Evaluation

The objective of the Phase I RFI was to determine whether a release had occurred from any of the SWMUs and AOCs at the Pekin Service Center. As specified in the RFI Workplan, this determination was made on the basis of laboratory data, which were subjected to data validation procedures described in the Workplan. This section provides the results of the quantitative evaluation of the laboratory data.

The laboratory data were evaluated quantitatively in terms of method detection limits, precision, accuracy, and completeness. Data which did not satisfy the quantitative criteria in the QuAPjP further parameters were defined as "qualified." Safety-Kleen has taken the conservative approach and qualified all data which do not satisfy the QC limits exactly. Safety-Kleen has also evaluated qualified data and determined if they can be used to achieve the project objectives. Qualified data which were found to be consistent with data which were not qualified were considered useful in achieving project objectives.

The laboratory data collected during the Phase I RFI included:

- Analysis of 20 investigative samples and two field duplicates for Volatile Organic Compounds (VOCs) by EPA Method 8240;

- Analysis of 20 investigative samples and two field duplicates for Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270;

- Analysis of 12 investigative samples and one field duplicate for Total Petroleum Hydrocarbons as Mineral Spirits (TPH) by EPA Method 8015 modified; and

- Analyses of 20 investigative samples, two field duplicates and eight background samples for eight RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver) on TCLP extracts by EPA inductively coupled plasma and graphite furnace atomic absorption methods.

Quality control data were collected at the following levels in accordance with the QAPjP:

1. Field (Blind) Duplicate Samples. Two [RFI-20 (6-8) and RFI-21 (10-12)] for the 20 investigative samples received.

2. Matrix Spike/Matrix Duplicate. At least one for each 20 samples received, with a minimum of two.

3. Surrogate Spiking. Added to all soil samples prior to extraction and analysis.

4. Method Blanks. One for each batch of samples, with a minimum of one per twenty samples.

TPH was not covered by the QuAPjP, but was added to the constituent list by IEPA in the approval letter dated June 21, 1994. IEPA did not specify any level of quality control effort in the analysis of TPH. Safety-Kleen conducted the level of effort specified by its standard operating procedure (Appendix D-3). This level of effort was:

1. Matrix Spike/Matrix Duplicates. At least one for each 20 samples. Three MS/MSD pairs were analyzed.

2. Surrogate Spiking. o-Terphenyl was added to all samples as a surrogate.

3. Method Blanks. One for each GC sequence. Three method blanks were analyzed.

In addition, one field blank was analyzed for 12 samples.

Method Detection Limits

The method detection limits (MDLs) goals are listed for each constituent in Table 5-1 of Appendix VIII-A of the QuAPjP. The actual MDLs for the analysis of each constituent in each sample are provided in the laboratory reports in Appendix C. All MDLs satisfied the goals.

Accuracy and Precision

The following criteria were used to validate data for accuracy and precision:

1. Accuracy

   - Holding Time Requirements
   - Surrogate Recovery Ranges (organic constituents only)
   - Matrix Spike Recovery Ranges
   - Instrument Calibration Frequency
   - Method Blanks
   - Laboratory Control Samples (inorganic constituents only)

2. Precision

   - Field Duplicate Results
   - Matrix Spike/ Matrix Spike Duplicate Reproducibility

For each of the criteria (except for field duplicate results), quantitative acceptability limits have been established in the QuAPjP and in SW-846. No quantitative acceptability ranges for field duplicate precision were established in the QuAPjP or SW-846. The objective of the laboratory data audit was to determine for which data these limits were not met and what effect those situations had on the use of the data to achieve the RFI objectives.

Completeness of the data was determined based on the percentage of data which satisfied the quantitative criteria above. The project objective for data completeness, established in the QuAPjP, was 95%.

VOCs. Holding times for the VOC analyses are presented in Table D-1; all VOC analyses were conducted within the required holding times. VOC QA/QC data on accuracy and precision are summarized in Table D-2. As discussed below, one of the 720 VOC investigative data (0.1%) was qualified because of a low surrogate recovery.

The QC objectives for accuracy were met for all VOC data except ethylbenzene in the field duplicate RFI-20(6-8). As shown in Table D-2, recovery of one surrogate (70% of bromofluorobenzene) in the field duplicate was slightly below the QC limit of 84%. In the duplicated sample [RFI-1(2-4)], all surrogate recoveries satisfied the QC limits. The only difference in the analytical results between the two duplicate samples was ethylbenzene at 0.0053 mg/kg in RFI-1(2-4) and below the detection limit of 0.005 mg/kg in duplicate RFI-20(6-8). The ethylbenzene result for RFI-1(2-4) may be more accurate because of the low surrogate recovery in duplicate RFI-20(6-8). Except for this one case, all surrogate and matrix spike recoveries were within QC limits.

Cyclohexanone (0.021 mg/kg) was detected in one of the four method blanks. This constituent was not detected in any of the investigative samples. Therefore, its detection in one method blank does not qualify any of the investigative data.

The QC objectives for precision were met for all VOC data; therefore, no VOC data were qualified because of imprecision. As shown in Table D-2, matrix spike/matrix spike duplicate reproducibilities (RPDs) were within QC limits. In addition, results on the two field duplicates were in exact agreement except for ethylbenzene in one of the duplicate pairs. A possible reason for this minor difference (0.0053 versus less than 0.005 mg/kg) is discussed above. The minor difference has no impact on the usability of the data.

SVOCs. Holding times of the SVOC analyses are presented in Table D-1; all SVOC analyses were conducted within the required holding times. SVOC QA/QC data on accuracy and precision are summarized in Table D-3. As described below, 36 of the 1240 SVOC investigative data (2.9%) have been qualified because of low surrogate recoveries.

As shown in Table D-3, one sample had one surrogate recovery that exceeded the control limits. The 2-fluorophenol surrogate recovery for Sample RFI-2(2-4) exceeded the control limit. However, because the only SVOC detected in this sample (di-n-butyl phthalate) is not associated with this surrogate, none of the SVOC data for this sample was qualified.

As shown in Table D-3, four samples had one or two surrogate recoveries less than the lower control limit. None of the data associated with the low 2-fluorobiphenyl surrogate recovery was qualified, because a second surrogate (2,4.6-tribromophenol is associated with the same constituent quantitation group, and the surrogate recoveries for this second surrogate were all within control limits. The 36 SVOC data associated with the low nitrobenzene-d8 surrogate recoveries were qualified. The 12 constituents in this quantitation group are listed in Table D-4. The qualified data are associated with three of the four samples collected at the waterhouse drain. Concentrations of the 12 SVOCs in the nitrobenzene-d8 quantitation group were below detection limits in the other sample collected at the warehouse drain and in the 16 investigative samples collected at the other SWMU and AOC. Therefore, the presence of the SVOCs in the three warehouse drain samples is unlikely based on the data from the 17 other investigative samples.

The spike recovery for Pentachlorophenol in the matrix spike sample RFI-10(6-8) slightly exceeded the QC limit (Table D-3). The list of constituents in the same quantitation group as pentachlorophenol is given in Table D-4. Due to the high spike recovery, data for all detected constituents in this group may be considered conservatively high in those samples associated with this matrix spike sample. The only constituent in this group that was detected during this investigation was Di-n-butyl phthalate. Because Di-n-butyl phthalate was not detected in any samples extracted or analyzed on the same days as RFI-10(6-8), no data have been qualified due to the spike recovery exceedence.

Di-n-butyl phthalate was detected in all three method blanks and bis(2-ethylhexyl) phthalate was detected in two of the three method blanks, as noted in Table D-3. These phthalates are common plasticizers used in the laboratory, and thus are commonly found in method blanks on other projects. None of the phthalate investigative data is qualified by the presence of phthalates in the method blanks, however, because the phthalate concentrations in the method blanks associated with the investigative samples in which di-n-butyl phthalate was detected were below the estimated quantitation levels (EQLs).

The QC objectives for precision were met for all SVOC data; therefore, no SVOC data were qualified because of imprecision. As shown in Table D-3, matrix spike/matrix spike duplicate reproducibilities (RPDs) were within QC limits for all samples. In addition, SVOC data for field duplicates compared well (consistently below detection limits) except for the one pair of detectable di-n-butyl phthalate concentrations (2.9 and 7.4 mg/kg). Safety-Kleen believes the imprecision is due to the introduction of di-n-butyl phthalate to the soil samples by the plastic wrap used on the brass rings. As discussed in Chapter III of the report, the presence of di-n-butyl phthalate corresponds to samples contained in brass rings wrapped in the plastic, and vice versa. Therefore, although the di-n-butyl phthalate data satisfy all quantitative QA/QC limits and thus are not qualified, their validity is highly suspect because of the correlation between the presence of di-n-butyl phthalate in the soil sample and the presence of the plastic wrap on the brass ring container.

Total Petroleum Hydrocarbons as Mineral Spirits. TPH as mineral spirits was analyzed (by modified EPA method 8015) in 12 samples as required by the IEPA approval letter. Since these analyses were not included in the original scope of work, no QC guidelines were established in the QuAPjP. The analytical and QC procedures followed are presented in the Safety-Kleen Environmental Laboratory Standard Operating Procedure manual for TPH-Mineral Spirits which is included as Appendix D-3.

The same level of QC was followed for TPH as for other organic analyses. Surrogates were added to all samples, matrix spike and matrix spike duplicate analyses were performed at a frequency of greater than one per 20 investigative samples. One field duplicate was analyzed for TPH for the twelve investigative samples. This was at a frequency of less than one per 10 investigative samples. However, since TPH as mineral spirits was not detected in any of the RFI samples, and since field TOV measurements did not indicate the presence of TPH as mineral spirits, the rate of 8% field duplicates rather than 10% (as specified in the QuAPjP for all other organic constituents), should not impact the overall quality of the data QC effort.

Holding times for the TPH analyses are presented in Table D-1, all TPH analyses were conducted within the required holding times. The TPH QA/QC data on accuracy and precision are presented in Table D-5. All of the QA/QC data (surrogate recoveries, matrix spike/matrix spike duplicate, field duplicates and method blanks) for TPH analyses were within the QC limits specified in the laboratory SOP, and with the general guidelines specified in SW-846 for EPA Method 8015. Therefore, no TPH data were qualified.

Metals. Holding times for the metals analyses are presented in Table D-1; all metals analyses were conducted within the required holding times. The metals QA/QC data for accuracy and precision are summarized in Table D-6. The QC level objectives were met for calibration check and laboratory control samples, matrix spike and matrix spike duplicate, method blanks and field duplicates.

The recovery for one chromium laboratory control sample exceeded the QA/QC limits. This exceedence would result in qualification of all detects of chromium in samples related to that laboratory control sample. Because chromium was not detected in any samples, there were no qualifications of chromium data.

Lead was detected in one of four lead method blanks. Because lead was not detected in any of the samples, there were no qualifications of lead data.

All other QA/QC data for all metals analyses were within laboratory control limits. Therefore, no metals data were qualified.

Completeness

Completeness is defined as the percentage of unqualified environmental data. Data are qualified if they do not satisfy the QC limits for accuracy and precision that have been established in the QuAPjP. Data qualifications are summarized below:

- One of 720 VOC data (0.1%);
- 36 of 1240 SVOC data (2.9%);
- 0 of 12 TPH-Mineral Spirits data (0%); and
- 0 of 160 metals data (0%).

The overall completeness is 98.3%, which exceeds the QC goal of 95% completeness. A list of all qualified data is presented in Table D-7.

Overall Evaluation of Data Representativeness and Comparability

Overall project data evaluation was conducted using the qualitative criteria of representativeness and comparability. This section describes this overall project evaluation.

Representativeness

Representativeness expresses the degree to which data accurately and precisely represent an environmental condition. Representativeness is a qualitative parameter which is dependent upon the proper design of the sampling program and proper laboratory protocol.

The sampling network was designed to provide data representative of worst-case site conditions at each solid waste management unit or area of concern. During development of this network, consideration was given to areas of known releases, areas where soils are stained, and areas where experience from similar sites indicates releases of hazardous waste and hazardous constituents are most likely to occur. The rationale of the sampling network is discussed in detail in the Sampling and Analysis Plan (SAP), presented in Part IV of the Workplan. The SAP received close scrutiny from technical professionals at IEPA and Safety-Kleen, an revisions were made in the final copies to reflect their comments. This insured proper design of the sampling and analysis program.

Representativeness was satisfied by ensuring that the SAP was followed, proper sampling techniques were used, proper analytical procedures were followed, and the QC limits for accuracy, precision, and completeness were met.

Representativeness can also be assessed by evaluation of the results of the blind duplicate analyses. The comparisons between the duplicate samples are shown in tables D-2, D-3, D-5, and D-6. The blind duplicates are in good agreement for all constituents except di-n-butyl phthalate (Dnbp). The detection of Dnbp in several samples may not be representative of environmental conditions at the site. As discussed previously, Dnbp was detected only in samples which were collected using new brass rings wrapped in shrink-wrap plastic.

Phthalates commonly occur as contaminants introduced during sampling and laboratory procedures. The inference that the detection of Dnbp may not be representative of conditions at the site is based on the correlation observed between the presence of shrink-wrap plastic on the brass ring containers and the presence of Dnpb in the soil samples.

Comparability

Comparability expresses the confidence with which one data set can be compared with another. Comparability is judged by compliance with the Workplan protocol. Because the workplan protocol was followed carefully, the data collected during the RFI should be comparable among themselves and with all other data collected using the same collection, analytical and quality assurance procedures.

TABLES

Table D-1. Holding Times, Soil Sampling, Phase I RCRA Facility Investigation, Safety-Kleen Corp. Service Center, Pekin, Illinois.

	Sample Collection Date	VOC Analysis Date	SVOC Extraction Date	SVOC Analysis Date	TPH Analysis Date	Metals Analysis Date
Allowable Holding Times		14 days	14 days	40 days	14 days	6 months
RFI-1(2-4)	8/10/94	8/18/94	8/16/94	8/19/94	NA	8/20/94 - 8/26/94
RFI-1(4-6)	8/10/94	8/16/94	8/16/94	8/19/94	NA	8/20/94 - 8/26/94
RFI-2(0-2)	8/10/94	8/16/94	8/16/94	8/20/94	NA	8/20/94 - 8/29/94
RFI-2(2-4)	8/10/94	8/16/94	8/16/94	8/20/94	NA	8/20/94 - 8/27/94
RFI-3(0-2)	8/10/94	8/17/94	8/16/94	8/20/94	NA	8/20/94 - 8/27/94
RFI-3(2-4)	8/10/94	8/15/94	8/16/94	8/20/94	NA	8/20/94 - 8/27/94
RFI-4(0-2)	8/10/94	8/15/94	8/16/94	8/20/94	NA	8/20/94 - 8/27/94
RFI-4(2-4)	8/10/94	8/15/94	8/16/94	8/20/94	NA	8/20/94 - 8/29/94
RFI-5(3-5)	8/10/94	8/15/94	8/16/94	8/24/94	8/16/94	8/20/94 - 8/29/94
RFI-5(5-7)	8/10/94	8/16/94	8/18/94	8/24/94	8/16/94	8/20/94 - 8/29/94
RFI-6(3-5)	8/10/94	8/15/94	8/18/94	8/24/94	8/16/94	8/20/94 - 8/29/94
RFI-6(5-7)	8/10/94	8/15/94	8/22/94	8/24/94	8/16/94	8/20/94 - 8/29/94
RFI-7(4-6)	8/10/94	8/15/94	8/22/94	8/24/94	8/16/94	8/20/94 - 8/29/94
RFI-7(6-8)	8/10/94	8/15/94	8/22/94	8/24/94	8/16/94	8/22/94 - 8/29/94
RFI-8(4-6)	8/10/94	8/15/94	8/22/94	8/23/94	8/16/94	8/22/94 - 8/29/94
RFI-8(6-8)	8/10/94	8/15/94	8/22/94	8/23/94	8/16/94	8/22/94 - 8/29/94
RFI-9(4-6)	8/10/94	8/16/94	8/17/94	8/20/94	8/18/94	8/22/94 - 8/29/94
RFI-9(6-8)	8/10/94	8/16/94	8/17/94	8/22/94	8/18/94	8/22/94 - 8/29/94
RFI-10(4-6)	8/10/94	8/18/94	8/17/94	8/22/94	8/18/94	8/22/94 - 8/29/94
RFI-10(6-8)	8/10/94	8/18/94	8/17/94	8/25/94	8/18/94	8/22/94 - 8/29/94
RFI-20(6-8)	8/10/94	8/17/94	8/16/94	8/20/94	NA	8/20/94 - 8/29/94
RFI-21(10-12)	8/10/94	8/16/94	8/17/94	8/23/94	8/18/94	8/22/94 - 8/29/94

NA = Not analyzed as part of the Phase I RFI

Table D-2. Soil Sample QA/QC Summary, Volatile Organic Compounds, Phase I RFI, Safety-Kleen Corp. Service Center, Pekin, Illinois.

Surrogate Recoveries

Sample	Sample Type	Toluene	Bromofluorobenzene	1,2-Dichloroethane - d4
Quality Control Limit		81-117	74-121	70-121
RFI-20(6-8)	Field Duplicate	89	**70**	84
All Others (21)	--	89-113	84-110	97-119

Matrix Spikes/Matrix Spike Duplicates

Sample	Benzene	Chlorobenzene	1,1-Dichloroethene	Toluene	Trichloroethene
Quality Control Limit (Spike Recovery)	76-127	75-110	61-145	76-125	71-120
Range of Sample Matrix Spike Recoveries (8)	94-104	82-102	108-120	89-111	85-99
Quality Control Limit (% RPD)	20	20	20	20	20
Range of % RPD (4 pairs)	3-10	3-6	3-10	4-7	1-5

Field Duplicates

Sample Duplicate Pairs	Ethylbenzene	All Other VOCs
RFI-1(2-4)	0.0053	ND
RFI-20(6-8)	ND(0.005)	ND
RFI-9(6-8)	ND(0.005)	ND
RFI-21(10-12)	ND(0.005)	ND

Method Blanks

Cyclohexanone only (0.021 mg/kg) detected in one method blank.
No VOCs detected in any of (3) other Method Blanks

Bold indicates outside QC control limits.

Table D-3. Soil ι A/QC Summary, Semi Volatile Organic Compounds, Phase I RFI, Pekin Service Center, Peki ,is.

Surrogate Recoveries

Sample	2-Fluorophenol	Phenol-d6	Nitrobenzene-d8	2-Fluorobiphenyl	2,4,6-Tribromophenol	Terphenyl
Quality Control Limit (SW-846)	25-121	24-113	23-120	30-115	19-122	18-137
RFI-2(2-4)	**122**	92	95	97	84	--
RFI-5(3-5)	44	58	24	**18**	80	--
RFI-5(5-7)	51	50	**21**	**21**	57	--
RFI-6(3-5)	37	39	**14**	**14**	63	--
RFI-6(5-7)	27	49	**16**	**9**	70	--
All Others (17)	27-118	38-92	24-95	38-113	57-98	

Matrix Spike/Matrix Spike Duplicates

Sample	Phenol	2-Chloro phenol	1,4-Dichloro-benzene	N-Nitroso di-n-propylamine	1,2,4-Trichlorobenzene	4-Chloro 3-Methyl Phenol	Acenapthene	4-Nitrophenol	2,4-Dinitro toluene	Pentachloroph enol	Pyrene
Quality Control Limit Spike Recovery (QuAPjP)	26-115	25-115	28-115	41-126	38-115	26-115	31-137	11-114	28-115	17-115	35-142
RFI-10(6-8)MS	89	84	69	99	70	85	78	91	74	**119**	59
RFI-10(6-8)MSD	75	70	62	90	64	72	72	76	65	102	54
Range of other Sample Matrix Spike Recoveries (4)	66-91	55-89	31-75	65-86	42-98	0-104	61-87	47-77	62-79	75-89	59-89
Quality Control Limit %RPD (QuAPjP)	35	50	27	38	25	33	25	50	47	47	36
Range of sample % RPD (3 pairs)	3-18	4-19	5-10	2-18	2-9	0-17	2-9	4-18	0-12	3-16	2-9

Field Duplicates

	SVOCs Di-n-butylphthalate	All Others
RFI-1(2-4)	2.9	ND
RFI-20(6-8)	7.4	ND
RFI-9(6-8)	ND	ND
RFI-21(10-12)	ND	ND

Method Blanks

Dnbp, detected @ 0.2 - 2.3 mg/kg in 3 of 3 Method Blanks (EQL = 0.66 mg/kg)
B2ehp (EQL = 0.66 mg/kg) detected below quantitation level in 2 of 3 Method Blanks

No other SVOCs detected in any of 3 Method Blanks

No Method Blank for 8/18/94 extraction batch

Note: Bold indicates data outside QC limits

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Table D-4. Semivolatile Internal Standards with Corresponding Analytes Assigned for Quantitation.

1,4-Dichlorobenzene-d4	Naphthalene-d8	Acenaphthene-d10	Phenanthrene-d10	Chrysene-d12	Perylene-d12
Benzyl alcohol	Bis(2-chloroethoxy)methane	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene
Bis(2-chloroethyl) ether	4-Chloroaniline	Acenaphthylene	4-Bromophenyl phenyl ether	Bis(2-ethylhexyl)phthalate	Benzo(k)fluoranthene
2-Chlorophenol	4-Chloro-3-methylphenol	1-Chloronaphthalene	Di-n-butyl phthalate	Butyl benzyl phthalate	Benzo(g,h,i)perylene
1,3-Dichlorobenzene	2,4-Dichlorophenol	2-Chloronaphthalene	4,6-Dinitro-2-methyl-phenol	Chrysene	Benzo(a)pyrene
1,4-Dichlorobenzene	2,4-Dimethylphenol	4-Chlorophenyl phenyl ether	Fluoranthene	3,3'-Dichlorobenzidine	Dibenz(a,h)anthracene
1,2-Dichlorobenzene	Hexachlorobutadiene	Dibenzofuran	Hexachlorobenzene	Pyrene	Di-n-octyl phthalate
2-Fluorophenol	Isophorone	Diethyl phthalate	Pentachlorophenol	**Terphenyl-d14**	Indeno(1,2,3-cd)pyrene
Hexachloroethane	2-Methylnaphthalene	Dimethyl phthalate	Phenanthrene		
2-Methylphenol	Naphthalene	2,4-Dinitrophenol			
4-Methylphenol	Nitrobenzene	2,4-Dinitrotoluene			
Phenol	**Nitrobenzene-d8**	2,6-Dinitrotoluene			
Phenol-d6	2-Nitrophenol	Fluorene			
	1,2,4-Trichlorobenzene	**2-Fluorobiphenyl**			
		Hexachlorocyclopentadine			
		2-Nitroaniline			
		3-Nitroaniline			
		4-Nitroaniline			
		4-Nitrophenol			
		2,4,6-Tribromophenol			
		2,4,6-Trichlorophenol			
		2,4,5-Trichlorophenol			

Bold = surrogate

Table D-5. Soil Data QA/QC Summary, Total Petroleum Hydrocarbons, Phase I RFI, Safety-Kleen Corp. Service Center, Pekin, Illinois.

Surrogate Recovery

Sample	o-Terphenyl
Quality Control Limits (Data Sheets)*	80-146
Samples (12)	84-102

* None specified in QAPP or SW-846; special method

Matrix Spike/Matrix Spike Duplicate

Sample	MS (105)
Quality Control Limits (Spike Recoveries)*	80-146
Range in samples (3)[1]	80-90
Quality Control Limits (% RPD)	25%
% RPD	1-4

* None specified in QAPP or SW-846; special method

[1] Includes 2 MS/MSD pairs analyzed in same batch as part of Extent of Degradation Investigation at Pekin Service Center

Field Duplicates

Sample	TPH
RFI-9(6-8)	ND(50)
RFI-21(10-12)	ND(50)

Method Blanks - TPH not detected in any of 3 Method Blanks

Table D-6. Soil Data QA/QC Summary, Metals, Phase I RFI, Safety-Kleen Corp. Service Center, Pekin, Illinois.

	Ba	Cr	Hg	As	Cd	Cr	Pb	Se	Ag
QC Check Samples (acceptable range)	90-110	90-110	90-110	90-110	90-110	90-110	90-110	90-110	90-110
Range (Number of samples in parentheses)	100-100 (2)	101-10 (2)	100-102 (2)	97-104 (2)	94-108 (5)	100-105 (4)	92-105 (4)	97-101 (2)	98-106 (2)
Laboratory Control Samples (acceptable range)	80-120	80-120	-[1]-	80-120	80-120	80-120	80-120	80-120	80-120
LCS range (Number of QA/QC samples in parentheses)	93-98 (3)	97-100 (3)	-[1]-	88-104 (4)	92-106 (5)	99-**121**[2] (4)	91-111 (5)	92-110 (4)	95-112 (3)

Matrix Spike/Matrix Spike Duplicate

MS/MSD	Ba	Cr	Hg	As	Cd	Cr	Pb	Se	Ag
- Acceptable Recovery Range	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120
Sample Spike Recovery [# of spiked samples in ( )]	81-91 (10)	85-108 (10)	95-102 (2)	91-119 (18)	83-95 (18)	90-113 (8)	76-111 (18)	82-104 (10)	82-95 (10)
- Acceptable % RPD Range	20	20	20	20	20	20	20	20	20
% RPD [# of pairs in ( )]	0-6 (5)	0-9 (5)	0 (1)	0-3 (9)	2-5 (9)	1-12 (4)	4-16 (9)	1-3 (5)	0-9 (5)

Field Duplicates

	Ba	Cr	Hg	As	Cd	Cr	Pb	Se	Ag
RFI-1 (2-4)	ND	ND	ND	ND	ND	ND	ND	ND	ND
RFI-2 (6-8)	ND	ND	ND	ND	ND	ND	ND	ND	ND
RFI-9 (6-8)	ND	ND	ND	ND	ND	ND	ND	ND	ND
RFI-2[1] (10-12)	ND	ND	ND	ND	ND	ND	ND	ND	ND

Method Blanks

	Ba	Cr	Hg	As	Cd	Cr	Pb	Se	Ag
Method Blank Result (Number of samples in parentheses)	(1)ND	(1)ND	(3) ND	(4) ND	(5) ND	(4) ND	(1) 4.5 (3) ND	(3) ND	(2) ND

[1] LCS and initial calibration check samples are the same for Mercury

[2] One LCS result out of range (121)

Bold indicates data out of QC limit

Table D-7. Summary of Qualified Analytical Data, Phase I RFI, Safety-Kleen Corp. Service Center, Pekin, Illinois.

1. VOC data qualified due to low surrogate recovery of bromofluorobenzene:

Sample:	RFI-20 (6-8)	Constituent:	Ethylbenzene	Analytical Result:	ND(0.05)

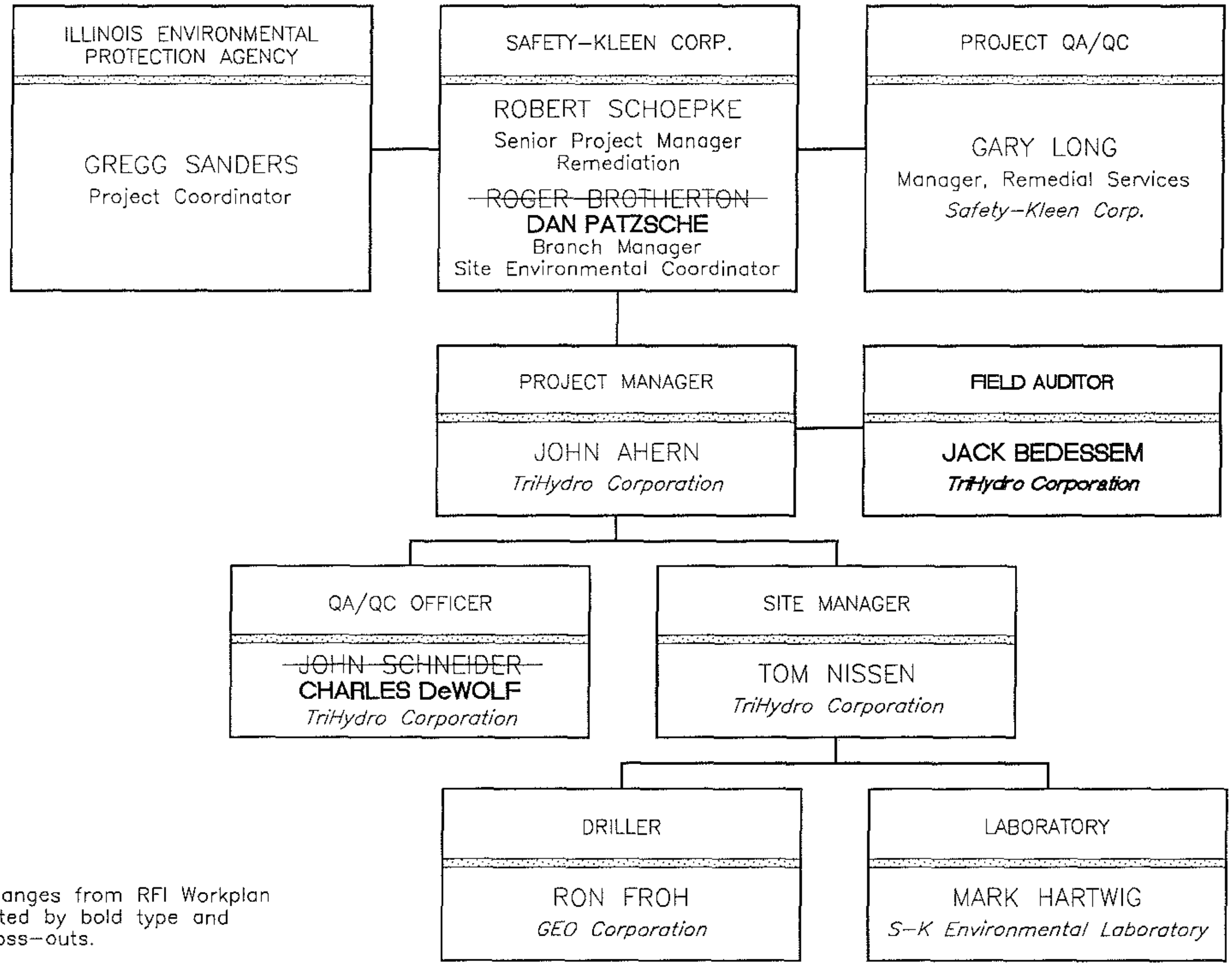
2. SVOC data qualified due to low surrogate recovery of nitrobenzene-d8:

Samples:	RFI-5 (5-7)	Constituents:	Bis(2-chloroethoxy)methane	Analytical Result:	ND in all cases
	RFI-6 (3-5)		4-Chloroaniline		
	RFI-6 (5-7)		4-Chloro-3-methyl phenol		
			2,4-Dichlorophenol		
			2,4-Dimethylphenol		
			Hexachlorobutadiene		
			Isophorone		
			2-Methylnaphthalene		
			Naphthalene		
			Nitrobenzene		
			2-Nitrophenol		
			1,2,4-Trichlorobenzene		

3. Data qualified for other QC limit exceedences:

Samples:	None	Constituents:	None	Analytical Result:	--

FIGURES



NOTE: Changes from RFI Workplan noted by bold type and cross-outs.

FIGURE D-1 :PROJECT MANAGEMENT TEAM, PHASE I RELEASE ASSESSMENT, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

SKPIMGNT

APPENDIX D-1

QUALIFICATIONS OF PROJECT TEAM MEMBERS

PROJECT: 999-190

STATEMENT OF QUALIFICATIONS

April 1994

Summary of Current TriHydro Clients

Client/Sites	Starting Date	Principal Services
Wyoming Department of Environmental Quality		
- Mountain View	1988	Contaminant source identification
- Laramie (Foster's Sinclair)	1990	Vapor and ground-water quality assessment, design and construction of trench to intercept vapors and hydrocarbon product
- Greybull	1992	Emergency response, design, and installation of residential vapor controls
Texaco Refining and Marketing, Inc.		
- Los Angeles Refinery (California)	1985	Hydrocarbon recovery, soil remediation, environmental assessment, regulatory reporting, ground-water monitoring
- El Dorado Refinery (Kansas)	1987	Hydrocarbon recovery, environmental assessment, air monitoring, vapor control, regulatory reporting
- Lockport Refinery (Illinois)	1985	Environmental assessment, regulatory reporting, NPDES evaluation, RCRA
- Bakersfield Refinery (California)	1992	Soil and ground-water quality remediation, environmental assessment
Golden West Refining Company		
- California Refinery	1985	Hydrocarbon recovery, environmental assessment, regulatory reporting, expert witness testimony, ground-water monitoring
Safety-Kleen Corp.		
- 40 sites (principally Midwest)	1988	RCRA closures, UST environmental assessments, regulatory reporting, soil remediation, ground-water remediation, RFIs
Sinclair Oil Corporation		
- Sinclair Refinery (Wyoming)	1985	Environmental assessment, ground-water monitoring, RCRA and State permitting, RFI, regulatory reporting
- Boise, Burley Terminals (Idaho)	1991	Environmental assessment
Miscellaneous Clients		
- Banner Associates (Wyoming)	1991	Municipal ground-water development
- Church and Dwight (Wyoming)	1991	Landfill permit, spill control plan at trona site
- D&B Services (Wyoming)	1992	Environmental assessment at oil field
- Enron (Colorado)	1991	UST environmental assessment
- First Interstate Bank	1992	Environmental audits

Summary of Current TriHydro Clients (continued)

Client/Sites	Starting Date	Principal Services
- Forsgren Associates (Wyoming)	1990	Municipal ground-water development
- Frontier Refining (Wyoming)	1991	Ground-water monitoring, RFI at petroleum refinery
- Holly Sugar Corporation (Wyoming, California, Montana)	1987	Ground-water assessment and monitoring, landfill permit
- Indian Refining Company (Illinois)	1985	RCRA closures, environmental assessments, waste management plans at petroleum refinery
- Koch Materials (Colorado, Kansas)	1991	Site assessments at asphalt plants
- Marathon Oil (Nebraska)	1992	Ground-water monitoring at oil/gas production site
- Shell Pipe Line Corp. (Wyoming)	1991	Assessment and remediation of crude oil spill
- Texaco Inc. (California)	1990	Expert witness testimony for tank farm
- Wheatland (Wyoming)	1987	Landfill permit and ground-water monitoring
- Wyoming Territorial Prison	1991	Ground-water monitoring

JOHN J. AHERN
PRINCIPAL

BACKGROUND

Mr. Ahern co-founded TriHydro Corporation in 1984. As a principal of the firm, his primary responsibilities include overall management of TriHydro Corporation, technical review, and regulatory compliance.

Mr. Ahern has over 19 years of experience in the environmental field. His areas of expertise include hydrocarbon spill assessment, recovery and remediation, hazardous waste management, water quality monitoring, ground-water development and supply, property transfer, environmental audits and expert testimony.

EDUCATION

University of Wisconsin:	M.S., Water Chemistry, 1976. "Impact and Management of Urban Stormwater Runoff."
University of Wisconsin:	M.S., Water Resources Management, 1975. Emphasis in Hydrogeology.
Amherst College:	B.A., Chemistry, 1971.

PROFESSIONAL EXPERIENCE

12/84 - Present	TRIHYDRO CORPORATION Water Quality Scientist Laramie, Wyoming
11/81 - 12/84	WESTERN WATER CONSULTANTS, INC. Water Quality Scientist Laramie, Wyoming
8/79 - 11/81	WYOMING WATER RESOURCES RESEARCH INSTITUTE Research Scientist Laramie, Wyoming
10/76 - 6/79	CH2M-HILL, INC. Environmental Scientist Denver, Colorado
10/75 - 6/76	WRIGHT-MCLAUGHLIN ENGINEERS Environmental Scientist Denver, Colorado

8/73 - 10/75	UNIVERSITY OF WISCONSIN Research Assistant Madison, Wisconsin
6/71 - 11/72	HICKOK AND ASSOCIATES Water Quality Lab Manager Wayzata, Minnesota

PROFESSIONAL AFFILIATIONS

National Water Well Association

EXPERIENCE

HYDROCARBON SPILL ASSESSMENT, RECOVERY, AND REMEDIATION

Assessment of spill migration and seepage loss tracer studies.

Recovery and recharge well maintenance during hydrocarbon recovery.

HAZARDOUS WASTE MANAGEMENT

Identification and quantification of hazardous waste.

Negotiations with regulatory agencies.

Design and supervision of water and soil sampling programs.

Preparation of closure plans and Part B permit applications.

WATER QUALITY MONITORING

Statistical methods for analysis of water quality data.

Quality control over laboratory analytical work.

Design and supervision of ground-water and surface-water monitoring programs.

Soil and ground-water quality clean-up at refineries and petroleum storage terminals.

Stormwater management studies for Denver, Anchorage, St. Louis, Madison, and eight cities in Illinois.

Technical and management advisor for a $4 million environmental impact statement in Milwaukee.

Principal investigator for research on water quantity-salinity conflicts in the Green River Basin, acid precipitation in Wyoming, and fisheries management in the Green River Basin.

GROUND-WATER DEVELOPMENT AND SUPPLY

Reservoir operations studies on the Little Bighorn River and Tongue River systems, Wyoming.

Water demand projections for Cheyenne, Wyoming.

Drill stem tests for quality and quantity estimates of possible municipal water supplies.

Ground-water resources studies in the Green River Basin, Wyoming.

PROPERTY TRANSFER, ENVIRONMENTAL AUDITS

Soils and ground-water evaluations at property conversion sites.

EXPERT TESTIMONY

Expert witness testimony for subsurface contamination.

JACK G. BEDESSEM, P.E.
CIVIL/ENVIRONMENTAL ENGINEER

BACKGROUND

Mr. Bedessem joined TriHydro Corporation in 1988. Prior to joining the firm, he was employed with the Wyoming Department of Environmental Quality Water Quality Division.

Mr. Bedessem's responsibilities at TriHydro Corporation include project management and engineering design of systems to assess and remediate soil and water quality degradation. Mr. Bedessem is also responsible for preparing and coordinating the preparation of hazardous waste facility, underground storage tank, and landfill closure plans, remedial action plans, RCRA facility investigation and correction action plans, and facility permits. In addition, he is responsible for supervising and coordinating the implementation of assessment, closure and remedial action programs.

Fields of competence include soil and ground-water engineering, water and wastewater engineering, site investigations, remedial design and implementation. Mr. Bedessem is familiar with Federal and State regulations concerning solid waste, hazardous waste (RCRA) underground storage tanks, water and wastewater.

EDUCATION

South Dakota State University:	Supplemental course work and research for advanced water, wastewater and environmental engineering, 1980 - 1982.
South Dakota State University:	B.S., Civil Engineering. Emphasis on water resources engineering, 1980.

PROFESSIONAL EXPERIENCE

8/88 - Present	TRIHYDRO CORPORATION Project Manager, Civil/Environmental Engineer Laramie, Wyoming
10/83 - 7/88	WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY/WATER QUALITY DIVISION Water Quality District Engineer/Supervisor Lander, Wyoming
6/82 - 9/83	WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY/WATER QUALITY DIVISION Water Quality Engineering Evaluator Lander, Wyoming

6/80 - 5/82	CITY OF BROOKINGS WASTEWATER TREATMENT FACILITY Wastewater Works Operator and Lab Technician Brookings, South Dakota
6/80 - 5/82	SOUTH DAKOTA STATE UNIVERSITY Water Quality Research Assistant Brookings, South Dakota

PROFESSIONAL CERTIFICATIONS

Professional Engineer #5372, Wyoming
Professional Engineer #27184, Colorado
Professional Engineer #11954, Kansas
Professional Engineer #E-7090, Nebraska
Professional Engineer #062-049091, Illinois

PROFESSIONAL AFFILIATIONS

National Water Well Association
American Society of Civil Engineers
National Council of Examiners for Engineering and Surveying

EXPERIENCE

SPILL ASSESSMENT, RECOVERY AND REMEDIATION

Management and engineering design (plans and specifications) of hydrocarbon recovery systems including interceptor wells and trenches, transmission and wastewater treatment systems. Management and engineering design (plans and specifications) of remediation systems including soil venting, vapor mitigation, bioremediation, land treatment, excavation/disposal and stabilization. Management and planninf of site investigations for soil and water degradation due to hydrocarbons.

Coordination of site assessments, remdial actions and emergency response actions with regulatory agencies.

Management and implementation of programs for monitoring, operation and maintenance of remedial action systems.

UNDERGROUND STORAGE TANK ASSESSMENT AND REMEDIATION

Preparation of closure plans in accordance with RCRA and State regulations.

Management of removal, assessment and remediation projects for tank systems which contained petroleum products, hazardous waste (spend solvent) and waste oils.

HAZARDOUS WASTE MANAGEMENT

Management and planning of investigation to assess soil, surface water, ground water and air at hazardous waste facilities . Assessment projects have included sampling and analysis of soil gas, soil, water and air. Management, engineering design and report preparation for remediation and closure of hazardous waste site including solvent recycling facilities, oils refineries, underground and above ground storage tanks, and container storage areas. Desings have included soil venting, ground-water extraction/interception and treatment, excavation/disposal, stabilization, decontamination/decommissionaing, vapor mitigation, and bioremediation. Technical evaluation of design, plans and specifications for construction of final hazardous waste landfill cover.

Technical evaluation of design, plans and specifications for wastewater treatment and disposal systems.

Development and evaluation of closure, decontamination and remedial action alternatives.

Management and preparation of project document including plans, report, specifications, operation/maintenance manuals, health/safety plans and bid documents.

SOLID WASTE MANAGEMENT

Implementation and development of plans to manage industrial solid waste streams.

Technical and regulatory evaluation of landfill permit documents and closure plans.

WATER QUALITY MONITORING

Development and implementation of plans to monitor surface water and ground-water quality in accordance with State and Federal regulations.

Development and implementation of plans to assess the horizontal and vertical extent of ground-water quality degradation.

Evaluation and reporting of water quality data for design of monitoring and remedial action programs.

Management of reoutine ground-water monitoring programs at hazardous waste and underground storage tank sites, in accordance with State and Federal regulations.

GROUND-WATER DEVELOPMENT AND SUPPLY

Inspection and evaluation of public ground-water supply treatment and distribution systems.

Technical advisor for water system operators training committee.

Technical advisor for public works standard specifications development council.

Technical evaluation of design, plans and specifications for water treatment and distribution systems for compliance with State and Federal regulations.

PROPERTY TRANSFER ENVIRONMENTAL AUDITS

Management and development of plans to evaluate potential environmental impacts, site conditions and history. Management and implementation of Level 1 through Level 3 site assessment plans.

THOMAS C. NISSEN, C.P.G.
GEOLOGIST

BACKGROUND

Mr. Nissen jointed TriHydro Corporation in April 1987. Prior to joining TriHydro, Mr. Nissen completed his M.S. Geology degree and was employed by the Geological Survey of Wyoming. At the time of hire, Mr. Nissen was employed by the Wyoming Water Research Center and was enrolled in additional graduate-level courses at the University of Wyoming.

Mr. Nissen is a senior project manager with TriHydro. His responsibilities include development, administration, and general management of subsurface environmental investigations in a wide variety of hydrogeologic environments. Management responsibilities include project coordination, staffing, budget control, subcontracting, interpretation of Federal and State regulations, and negotiations and client liaison with regulatory agencies.

Mr. Nissen's areas of expertise include regulatory compliance, permit and plan preparation, implementation, and reporting, including RCRA Closure, Post-Closure, Part B, RFI, and NPDES for hazardous and solid waste management and underground storage tank (UST) facilities. Mr. Nissen has designed and supervised implementation of numerous ground-water quality monitoring and remediation programs with emphasis on economic, and Federal, State, and local regulatory issues.

EDUCATION

University of Wyoming:	Supplemental coursework in Geohydrology, 1986-1987.
University of Wyoming:	M.S., Geology, 1985. Specialized in Geomorphology. Thesis titled, "Field and Laboratory Studies of Selected Periglacial Wedge Polygons in Southern Wyoming."
University of Wyoming:	B.S., Geology, 1981. Emphasis on physical and sedimentary geology.

PROFESSIONAL EXPERIENCE

4/87 - Present	TRIHYDRO CORPORATION Geologist Laramie, Wyoming
1/87 - 4/87	WYOMING WATER RESEARCH CENTER Hydrologic Research Aide Laramie, Wyoming

6/86 - 10/86	GEOLOGICAL SURVEY OF WYOMING Geological Researcher I/Landslide Specialist Laramie, Wyoming
6/85 - 9/85	WYOMING STATE HIGHWAY DEPARTMENT Highway Engineering Geologist Cheyenne, Wyoming
1982 - 1984	UNIVERSITY OF WYOMING Teaching Assistant Laramie, Wyoming
1982 - 1983	WESTERN RESEARCH INSTITUTE Graduate Research Appointee Laramie, Wyoming
6/81 - 8/81	GULF MINERAL RESOURCE COMPANY Assistant Field Geologist Casper, Wyoming

PROFESSIONAL CERTIFICATIONS

Wyoming Board of Professional Geologists (PG-595)

American Institute of Professional Geologists (C.P.G. #8669)

OSHA Health and Safety Training for Hazardous Waste Operations and Emergency Response (maintained since 1988)

OSHA Hazardous Waste Operations Manager (maintained since 1988)

PROFESSIONAL AFFILIATIONS

National Water Well Association
National Ground Water Association
Society of Sigma Xi
American Quaternary Association

EXPERIENCE

SPILL ASSESSMENT, RECOVERY, AND REMEDIATION

Design and supervision of hydrocarbon recovery, soil, and ground-water assessment and remediation programs at petroleum refineries, UST sites, and above-ground storage tank sites, including planning, budgeting, and subcontracting. Job locations include California, Wyoming, Nebraska, Kansas, Illinois, and Indiana.

Installation of hydrocarbon recovery and ground-water extraction systems, including design and construction of wells, supervision on design and construction of fluid collection and transmission piping, fluid storage and power.

Spill extent of degradation investigations (soils and ground water).

Emergency response assessment of petroleum spills at above-ground storage tank facilities in Kansas.

Permitting of ground-water discharge with municipal and state agencies.

UNDERGROUND STORAGE TANK ASSESSMENT AND REMEDIATION

Design and implementation of Closure and Post-Closure Plans under RCRA and UST regulatory programs in Nebraska, Kansas, Iowa, Illinois, and Wisconsin.

Design and implementation of UST subsurface assessments, sampling and analysis plans, and remediation programs (soils and ground water).

HAZARDOUS WASTE MANAGEMENT

Development and implementation of RCRA Closure Plans, Post-Closure Plans, Part B Permit Applications, and Waste Analysis Plans for Hazardous Waste Management Units at petroleum refineries and UST facilities in California, Nebraska, Kansas, Iowa, Wisconsin, and Illinois.

Extent of degradation investigations.

Permitting for disposal of hazardous wastes.

Data collection and interpretation; report preparation.

Identification and quantification of hazardous wastes.

SOLID WASTE MANAGEMENT

Development and implementation of assessment and remediation plans for solid waste management units (SWMUs) and wastewater treatment units at petroleum refineries, UST facilities, industrial landfills, and sugar factories in California, Wyoming, Kansas, Iowa, Illinois, and Indiana.

Extent of degradation investigations.

Permitting for disposal of non-hazardous wastes.

Data collection and interpretation; report preparation.

WATER QUALITY MONITORING

Design and construction of ground-water monitoring wells at petroleum refineries, UST sites, and industrial landfills with emphasis on regulatory issues.

Collection and interpretation of ground-water quality data from petroleum refineries, UST sites, and other hazardous waste management facilities, industrial landfills, and petroleum spill sites.

GROUND-WATER DEVELOPMENT AND SUPPLY

Evaluation of municipal ground-water supply alternatives throughout Wyoming under contract to the Wyoming Water Development Commission, including local/regional ground-water use, water rights impacts, and permitting issues, and hydrogeologic evaluation through literature search and photogeologic and field geologic mapping.

Exploration and drilling for large-production ground-water resources for municipal water supplies in Wyoming.

PROPERTY TRANSFER ENVIRONMENTAL AUDITS

Soil and ground-water quality assessments for land parcels considered for sale or lease at a shutdown oil refinery in Illinois.

Soil and ground-water quality assessments for a property in an industrialized property considered for purchase in California.

MINING

Hydrogeologic evaluation and characterization for restoration of abandoned open-pit uranium mine lands in Wyoming under abandoned mine lands (AML) programs.

OTHER

Geology

Photogeologic and diverse field geologic mapping.

Unconsolidated sediment sampling and laboratory analyses, including particle-size analysis, mineralogical analysis, and SEM analysis.

Collection and analysis of single-channel seismic refraction data for highway construction rippability assessments.

Wellsite supervision and borehole lithologic logging.

Geochemical sampling and reconnaissance for hard-rock uranium and other commodities in the Selkirk Mountains, Idaho, and Washington.

Vadose Zone Investigations

Collection and interpretation of vadose zone monitoring data to define the nature and extent of contaminations in unsaturated soils at petroleum refineries, UST sites, and other hazardous waste management facilities, industrial landfills, and petroleum spill sites.

Geomorphology and Soil Science

Interpretation of surficial geologic processes

Paleogeographic and paleoclimatic reconstruction

Soil description, sample collection, and lab analysis

CHARLES P. DeWOLF
GEOCHEMIST

BACKGROUND

Dr. DeWolf has been a geochemist at TriHydro Corporation since September, 1993. He completed a Ph.D. in Geology in June 1993, and has nine year's experience in general, analytical, and inorganic chemistry. He also has experience in descriptive field geology, geologic mapping, and computer modelling.

At TriHydro, Dr. DeWolf has been involved in underground storage tank assessment, hydrocarbon spill assessment, and water quality monitoring. He has been responsible for preparing sampling and analysis plans, quality assurance performance plans, and monitoring reports for regulatory compliance.

EDUCATION

University of Michigan:	Ph.D., Geology, 1993. "Investigations of Monazite and Garnet Chronology and Applications to the Archean Gneiss Terrane of the Wind River Range, Wyoming."
University of Michigan:	M.S., Geology, 1990
Williams College:	B.A., Chemistry, Environmental Studies, 1982

PROFESSIONAL EXPERIENCE

1987-1993	UNIVERSITY OF MICHIGAN Graduate Research Assistant Ann Arbor, Michigan
1987-1993	UNIVERSITY OF MICHIGAN Graduate Teaching Assistant Ann Arbor, Michigan
1983-1986	FOUNTAIN VALLEY SCHOOL High School Science Teacher Colorado Springs, Colorado

PROFESSIONAL AFFILIATIONS

American Geophysical Union
Geochemical Society

EXPERIENCE

UST ASSESSMENT

Performed soil boring and sampling program for assessment of UST spills, compiled analytical data on soil and ground-water impacts, prepared report.

HYDROCARBON SPILL ASSESSMENT

Plan and perform subsurface assessments of hydrocarbon impacted sites including installation of boreholes and ground-water monitoring wells, soil and ground-water sampling, and soil gas survey.

HAZARDOUS WASTE MANAGEMENT

Design water and soil sampling programs; field collection of soil and ground water at contaminated sites; compile data and prepare reports.

WATER QUALITY MONITORING

Design of ground-water monitoring programs; sampling and analysis workplan preparation, data compilation and report preparation; quality control over laboratory analytical work.

CHEMICAL INSTRUMENTATION

Operation and maintenance of mass spectrometers, electron microbeam equipment for high precision isotopic and elemental analyses; data quality control and evaluation of analytical algorithms.

GEO
ENVIRONMENTAL

STATEMENT
OF
QUALIFICATIONS

MOBILE
LABORATORY
SERVICES

1.0 GEO Corporation

1.1 The Corporation

GEO Environmental is a division of the GEO Corporation, a diversified geoscience company specializing in on-site chemical analysis and sampling. Founded in 1986 and staffed by more than 30 professional scientists, GEO Corporation's specialty is mobile laboratory analysis and sample collection. GEO uses the most modern mobile and fixed laboratory instrumentation in addition to manual and hydraulic sampling equipment.

1.2 Small Business Status

GEO Corporation is a Colorado corporation with headquarters at 400 Corporate Circle, Suite F, Golden, Colorado. The company has small business status and is listed with the Small Business Administration. GEO Corporation practices equal employment opportunity as well as equal treatment of clients.

1.3 GEO Environmental

GEO Environmental presently offers mobile laboratory services in the continental United States. GEO has at its disposal a fleet of 5 mobile laboratories and 7 drill rigs. Each mobile laboratory has a cellular phone. The FAX number is (303) 279-5187.

1.4 Regional Offices

The National Sales Manger is Bob Elliott (303-279-4655).

Rocky Mountain Region (Colorado) (303) 279-4655
Contact: Ron Froh

Great Lakes Region (Michigan) (313) 344-2110
Contact: Phil McElhinney

Western Region (Utah) (801) 566-4590
Contact: Rolf Larsen

Southwest Region (Texas) (713) 338-1015
Contact: Jim Duty

Southeast Region: (Georgia) (404) 425-2828
Contact: Larry Look

2.0 Corporate Mission

The mission of GEO Environmental is to provide to its clients technically competent services related to mobile lab services and environmental sampling.

3.0 Corporate Values and Philosophy

We believe that we serve our clients most effectively when we work actively with them in the production of a final product of the highest quality. GEO is committed to excellence in service and in the product we provide clients. This means that clients get a superior product in real time, which allows decisions to be made at the time of sampling. This saves our clients time and money.

We believe that we serve our community, state, and country with pride when we practice both good corporate and individual citizenship. Our staff and employees are encouraged to involve themselves in activities which will improve the quality of life.

We believe that we serve profitable corporate growth when we draw upon the talent and experience within GEO Environmental. We are dedicated to working as a team of professionals.

4.0 Products and Services

GEO Environmental offers a variety of services related to site investigation and remediation. These are available individually or may be grouped to meet the needs of our clients. GEO Environmental provides high quality, legally defensible data in real time. Our ability to customize services for specific projects results in significant savings of time and money for our clients, while producing a superior product.

<u>GEO Market Segments</u>

* Pipelines
* Emergency Response
* Landfills
* Underground Storage Tanks
* RCRA Remediation Sites
* Superfund Sites

Scope of Services

* Soil Vapor Surveys
* Soil Vapor Monitor Installation
* Mobile Laboratories
* On-Site Sample Collection & Analysis
  - Soil Samples
  - Water Samples
  - Soil Vapor Samples
* Monitor Well Installation
* Disposable Aquifer Implants
* Hydropunch Capability
* Chemistry Consulting

5.0 Business References

GEO Environmental has drilled and analyzed samples at more than 500 sites since 1990 throughout the United States. References are available from our corporate office for clients who have used both mobile laboratory and drilling services.

6.0 Personnel Qualifications

GEO is committed to a high degree of professionalism. Because of this, all chemists, geologists and technicians have the appropriate degrees and experience to provide the best possible technical services.

7.0 Field Sampling Equipment

GEO Environmental has custom designed its equipment for field sampling and analysis. GEO matches field sampling equipment to the needs of the client, the type of sample taken, and the terrain on the job site. The following is a list of the kind of equipment available.

7.1 Scorpion hydraulic drilling rigs

* Soil gas, water, and soil probing capability to 30 feet
* 5 foot mast (small enough to sample in tight places)
* Built on a 15 horsepower All Terrain Vehicle (ATV)
* Fast: uses a Stanley hydraulic hammer
* All contaminated soil remains in the hole

7.2 One-Ton 4x4 Viper Hydraulic Probing Rig

* Soil gas, water and soil probing capability to 50'
* 1", 3/4", 1/2" factory slotted PVC monitor wells
* Continuous or interval coring capability
* Cuts through concrete 2' deep
* 4000 psi hydraulics
* No soil cuttings: all contaminated soil stays in the hole
  soil density tests
* 10-foot mast can be lowered for passage through low overhangs

7.3 Hand Held Drilling Equipment

* Useful in confined spaces or when site access is restricted
* 1½ inch masonry bit with electric drill
* Drilling depth to 15 feet
* Soil sampling by split spoon sampler
* Water sampling with retract-a-tip probe

7.4 Soil Gas Probes

* Hand held probes: 5/8 inch outside diameter with 5/8 inch stainless-steel retract-a-tip probe
* Scorpion probes: 1 inch outside diameter with 1 inch stainless-steel retract-a-tip

7.5 Steam Cleaner

* For decontaminating probe rods and samplers
* Landa Steam Cleaner and Hotsy 550
* Hot (up to 200° F.) and cold rinse capability
* 1500 psi washing pressure
* 250 gallon water tank
* Complete with trailer and generator

7.6 Field Sampling Methodology

GEO offers state-of-the-art sampling methodologies for soil vapor, water and soil sample collection. In particular, GEO has a unique method of real-time ground water sampling, thereby avoiding costly monitoring well installation until the contaminant plume is characterized.

The Expendable Aquifer Sampling Implant (EASI) is capable of groundwater sampling to 50', with well materials costing $20.00. It works well in clay lithologies where purgeable water is hard to find. The EASI is truly expendable and temporary: it can stay in place for days or months and is easily abandoned with minimal site disruption.

GEO also has continuous core soil sampling and hydropunch capability. Please call for more information.

8.0 Field Analytical Equipment

8.1 Mobile Laboratories

GEO uses cubivans or maxivans with raised fiberglass roofs for its mobile laboratories. These laboratories are fully insulated, air conditioned, and heated to maintain uniform temperatures. All of our mobile laboratories have their own generators as a power source.

8.1.1 Gas Chromatographs

Each mobile laboratory has laboratory grade temperature programmable gas chromatographs configured to the exact specifications of the client's project plan and data quality objectives. GEO uses SRI 8610-50 and Hewlett-Packard 5890 Series II gas chromatographs equipped with multiple detectors. PID, FID, ECD, and TCD detectors as well as LC and GC/MS are employed, allowing GEO to analyze for volatile and semi-volatile organic compounds using SW-846 methods. The gas chromatographs are sensitive to parts per billion (ppb) in the field. The SRI 8610 uses Peak Simple III software which enables it to run two chromatographs with two detectors simultaneously, while the HP GC's and GC/MS utilize the Chemstation software, which allows four detectors to be monitored simultaneously. In addition, the SRI 8610 has purge and trap capabilities, while the HP 5890's utilize OI purge and trap devices. Both are used for the analysis of water and soil samples for volatile hydrocarbons and solvents.

GEO also has a GC/MS mobile lab equipped with a Hewlett-Packard 5971 quadropole mass-selective detector and 5890 Series II GC for volatile and semivolatile analysis. Volatile sample introduction is accomplished using an OI Purge and Trap unit. In general, GC/MS is sensitive to parts per billion similarly to GC, but has the added important feature of providing additional compound-specific information. This means that each compound identification is confirmed by the individual compound chromatographic retention time and corresponding mass spectrum. In this regard, GC/MS is more efficient than GC, and should be considered when it is important to have an additional level of compound identification.

8.1.2 Semivolatile Testing and Analysis

The most recent equipment addition to GEO Environmental's mobile laboratory is a Hewlett-Packard supercritical fluid extractor (SFE). It uses small solvent aliquots and liquid carbon dioxide to extract semivolatile compounds, especially diesel-range hydrocarbons. This will allow extractions to be carried out in real time, with a typical total extractable hydrocarbon extraction being completed in 10 minutes. GEO also has a high-pressure liquid chromatograph (HPLC) with fluorescent detection is available, especially for polynuclear aromatic hydrocarbon analysis. With the HP GC configuration of PID, FID and ECD detectors, the SFC and HPLC open possibilities of being able to carry out the gamut of environmental contaminant analyses in real time. In particular, PCB's and pentachlorophenol can be analyzed. Please call to discuss your unique analysis needs.

8.2 Methodology of Field Sampling and Analysis

8.2.1 Soil Gas Methods

GEO uses EPA soil gas methods consistent with the Field Screening Methods Catalog and Volume II of SW-846. The technique uses a stainless steel soil gas probe driven to at least 4 feet, or to as deep as a foot above the groundwater, depending on site parameters. Once the probe is driven to depth the retract-a-tip is opened and a vapor sample is drawn to the surface. The pressure of the sampling stream is measured to ensure that a vacuum does not exist, and a sample is collected in a glass sampling bulb after purging the system a minimum of three volumes. Surrogates are added to the bulb prior to analysis. The analysis is carried out on a GC with the appropriate detectors for the given compound list.

If desired, soil gas split samples can be submitted to fixed labs for confirmation using some kind of evacuated sampling container such as a Summa canister, or the following sampling method: a 50 ml vapor sample is collected on an adsorbent trap at ambient temperature. This is accomplished by attaching an adsorbent tube onto the sample collection tube, and then drawing the sample through the adsorbent. The sample is then either solvent or thermally desorbed prior to GC, with the detector choice and detection limits predicated by the analytes of interest.

8.2.2 Soil Gas QA/QC Procedures

Surrogates are added to soil vapor samples to evaluated sample integrity and ensure proper GC performance. Matrix spikes can also be evaluated. Sampling blanks are run at least one every 20 samples to evaluate carryover between samples. The GC calibration is checked on a daily basis by comparing a 4-point calibration curve for the analytes of interest to daily continuing calibration verification standards (CCVs). Other additional QA/QC procedures will be carried out at client request.

8.2.3 Soil, Groundwater and Soil Vapor Analysis Methodology

GEO uses SW-846 methods, including 8020/8015 and method 5030 (purge and trap). BTEX and MTBE are determined using the PID detector and TVH is determined using the FID detector. If required, TEH can be done in the field or at our Golden, Colorado facility. TEH extraction is done by using the California LUFT method or SW-846 method 3650 (SFE method), depending on state requirements. MTBE is done by ASTM method D-4815. TVH is a primary on-site hydrocarbon detection method: the FID chromatogram can be used to evaluate the need for doing TEH. Chlorinated solvents are easily analyzed in the field using the GC/PID/ECD and EPA method 8010. Either purge and trap sample introduction or soil vapor samples can be analyzed for 8010 and 8020 list compounds. Toxic Compound List evaluations can be run by GC/MS or GC/ECD/PID. Biogenic gasses (nitrogen, oxygen, methane, carbon dioxide) are important for landfills and can be run by GC/TCD. Other volatile compounds, such as alcohols ethers, esters, etc. can be evaluated. Please call with your unique compound list and let us help design your survey.

9.0 Documentation of Activities

All sample analyses are documented and filed permanently at GEO corporate offices. GEO backs up the scientific integrity of all professional services, and documents all practices and procedures.

9.1 Analytical Report

GEO provides a complete written assessment report at the completion of sampling and analysis. An initial field report of the results is provided on-site as the data are generated. The final report may include site maps with sample locations, overall summary of sampling procedures, soil conditions, analytical results, and professional recommendations. Reports can be FAXed directly to the client. GEO provides customized services: let us help you get the documentation you need.

GEO Environmental offers two different types of data reports to its clients. These are called LEVEL I and LEVEL II. The difference between these packages is the amount and kind of quality control samples (QC) analyzed with a batch of samples. This assures that each client receives data suitable for a particular need. These QC levels are recognized as industry standards for field methods and provide a way of creating data of known and consistent quality which meet specific data quality objectives.

9.1.1 Level I Report

This is the basic GEO Environmental report. The data are generated using a daily calibration check, blanks and the usage of surrogates in each sample type. The daily check, carried out before any samples are run, verifies that the instrument is performing according to specifications. The analytes must fall within 30 % of the previous calibration. Blanks are analyzed to ensure that there is no background causing potential false positive determinations. For soil vapor, the blank is drawn from the atmosphere at the site. Surrogates are added to each sample prior to analysis, including soil vapor samples. The purpose of surrogates is to simulate the behavior of the analytes during the analysis, thereby ensuring that the analysis will yield valid results. They also indicate matrix effects, although surrogate determinations are not proof of a matrix effect on a given analyte.

The report consists of a tabular data summary and a cover letter which describes potential anomalies. Surrogate recoveries are not included. Also, chromatograms are included for an additional charge.

9.1.2 Level II Report

This report allows for maximum flexibility in meeting client DQO's for a specific project. GEO Environmental is committed to aiding clients in meeting all project-specific needs. The analysis is the same as a Level I test, with options to enhance quality control and reporting options. The options are as follows:

Quality Control Options

GEO Environmental will provide additional quality control, to be carried out for QC batch lots of 20 (or fewer) samples. These options include:

--Matrix spikes
--Duplicate matrix spikes
--Duplicate sample determinations
--Continuing calibration verifications (CCV'S)
--QC check samples (prepared by a third-party source)
--Laboratory control spikes
--Additional blanks, including method and instrument blanks
--End of the day bracketing CCV's

Each of these options must be specified in advance of the actual analysis. In general, the charge for specific QC will be the same as an additional analysis. Charges for blanks will be determined by the overall bid structure. Please call for details

GEO Environmental is committed to providing data of known and consistent quality, and will endeavor to provide whatever quality control is needed for the intended end usage of the data. Let us help you design your sampling and analysis plan.

Reporting Options

GEO Environmental will provide enhanced reports on a project-specific basis. These options include the following:

--Altered report format to meet specific needs
--QC data summaries
--Copies of all chromatograms
--Computer data disks or other special formats

Each of these options must be arranged in advance. Because of the additional time it takes to produce modified formats, the specific per sample cost will reflect the additional work required.

GEO Environmental stands ready to help you define the scope of work for your project in advance. Let our team of professionals help you get the highest quality field data for a reasonable price.

10.0 Chemistry Consulting

GEO Environmental offers unique services for the environmental consultant. The first is the GEO Project Manager (PM). Each large project is assigned a Project Manager. The PM is the senior chemist on-site and is the single point-of-contact for the client. PM's call the client before the project starts to go over the scope of work. The PM oversees both sampling and analysis, and works with the clients to change the scope of work as the analysis guides the sampling. PM's also are responsible for meeting data quality objectives, and continues to work with the client after the project is completed to make sure the report is accurate and quickly prepared.

GEO also offers chemistry consulting through **ChemPartner**. This service is of great value to the small company who cannot afford to have a full-time chemist on staff, but who need professional chemistry consulting services. Our team of professional chemists, including a Ph.D. chemist, have many years accumulated experience in all phases of environmental analysis, including preparing quality assurance program plans, methods development, unusual matrix samples and determinations, data validation, and preparing reports of all types, including CLP forms packages. From selecting the best possible methodologies and sampling schemes for remediation projects, both big and small, to carrying out data review and interpretation once the project is done, GEO Environmental **ChemPartner** assists clients in all phases of the project.

11.0 Training, Health, Safety, and Insurance

11.1 Personnel Training

All GEO field employees receive the 40 hour OSHA safety training specified in 29 CFR 1910.120, and a physical examination consistent with 29 CFR 1910.134 and 29 CFR 1910.120 for working with hazardous waste and respirator usage. In addition each employee is thoroughly acquainted with the GEO Safety Plan and Hazard Communication Program.

11.2 Health and Safety Plan

All GEO employees are provided with appropriate safety gear, including safety glasses, hard hats, steel toe boots, and adequate clothing. OSHA health and safety plan guidelines are followed; a medical monitoring plan is also in place.

11.3 Insurance

GEO has liability insurance coverage and each employee is covered by Workman's Compensation and major medical insurance.

12.0 Professional Staff

12.1 RONALD D. FROH

- President, GEO Corporation
- B.S., Geology, Michigan Technological University

AREAS OF EXPERIENCE SINCE 1981

Technical supervisor for underground storage tank sites, industrial sites, modeling and computer applications, project management, remedial vapor extraction monitoring system
designs, air monitoring remedial efficiency designs, safety programs officer, mobile analytical laboratory designer, groundwater sampling design coordinator, and project liaison officer.

MAJOR CLIENTELE

- Industry in the categories of: environmental, oil & gas, minerals
- Major oil & gas companies
- Banks and lending institutions
- Major consulting firms

GEOGRAPHICAL LOCATIONS OF SIGNIFICANT EXPERIENCE

Colorado, Oklahoma, Texas, North Dakota, Montana, Nevada, Illinois, Wyoming, Kansas, Ohio, New Mexico, Louisiana, Arkansas, Wisconsin, Michigan, South Dakota, and Nebraska

BEFORE JOINING GEO ENVIRONMENTAL

- XCO OF COLORADO, INC. - Geologist
- TOOKE ENGINEERING - Geologist
- ONYX PETROLEUM - Senior Geologist
- TEXCO PETROLEUM - Geologist
- EXPLORATION SERVICES, INC.- Regional Manager
- TD ENGINEERING, INC.- Regional Manager/geologist
- WHITE PINE COPPER COMPANY - Staff geologist

12.2 ELIZABETH D. SEXTON

- Director of Chemistry
- Ph.D., Analytical Chemistry, Pennsylvania State University
- M.S., Analytical Chemistry, University of Denver
- B.A., English, Grinnell College

AREAS OF EXPERIENCE

Consultant to geologists, engineers and geochemists on project-specific analysis selection and data interpretation. Quality Assurance Program Plans, sampling schemes. Laboratory certification. Working knowledge of Federal program requirements (CWA, SDWA, RCRA, SARA)Environmental and Trace analysis, emphasizing trace organic methods. Experience in EPA protocol (500, 600, SW846), SDWA, RCRA, CERCLA, LUST/UST testing, Hazardous waste characterization, environmental toxic testing in human and biological specimens, FDA contaminant and pesticides methods, AOAC and AWWA procedures. Background in GC, HPLC, GC/MS, SFC, SFE, thermal methods, purge and trap, ICP, AA, IC, enzymatic and wet chemical methods.

BEFORE JOINING GEO ENVIRONMENTAL IN 1992

- Laboratory Director, Analytica, Incorporated. - Technical oversight for 4M, 60 person environmental testing lab, including customer consultations and quality assurance.
- Operations Manager, Analytica, Incorporated. - Laboratory systems management, including making sure all systems conform to EPA regulations.
- Supervising Chemist, Colorado Department of Health. - Supervised 6 chemists and 3 lab technicians in organic environmental analysis. Duties included consultation, and method development.
- Consultant, Lab Support, Inc. - Environmental analysis by GC. Set up capillary GC methods.
- Instructor, Metropolitan State College. - Taught environmental chemistry course part-time.
- Visiting Assistant Professor, University of Nevada, Las Vegas. - Taught basic and advanced analytical chemistry. Set up and administered graduate program in environmental chemistry. Supervised student research.
- Research Scientist, United States Environmental Protection Agency. - Part-time research position in supercritical fluid chromatography and azo dye chemistry. Developed protocol for microextraction of azo dyes.

PUBLICATIONS

- Determination of Organochlorine Pesticides in Serum, E. D. Sexton, Y. K. Herman, L. A. Smith (in preparation).
- Supercritical Fluid Extraction of Pesticides from Fish, E. D. Sexton, USEPA/EMSL internal report, November 1988.
- Microextraction of Azo Dyes from Wastewater, E. D. Sexton, S. M. Pyle, T. L. Jones and L. D. Betowski, USEPA/EMSL report.
- Instrumental Methods of Analysis of Sulfur Compounds in Synfuel Process Streams, J. Jordan, E. Sexton, J. Stahl, J. Talbott, J. Yakupkovic, DOE/PC/40783-T11, T-12 (1983). -T13, -T14 (1984).
- EPA Methods of Chemical Analysis for Oil Shale Waste, J. Wallace, L. Alden, E. Sexton, Denver Research Institute Contract, #68-032791 (1982).
- Enthalpimetric Study of the Surface Interaction of n-butylamine with Silica Gel. J. K. Grime and E. D. Sexton, Anal. Chem. (1982), 54, 902.
- Fixed-Time Kinetic Enthalpimetry: Improved Sensitivity for Enthalpimetric Enzyme Activity Determinations in Homogeneous and Heterogeneous Systems, J. K. Grime and E. D. Sexton, Anal. Chem.

Acta. (1980), 121, 125.

- Comparison of Methods of Trace Metal Enrichment for XRF Determination, D. E. Leyden, W. Weigscheider, W. B. Bodnar, E. D. Sexton, W. F. Nonidez, Analytical Techniques in Chemistry, J. Albaiges, Editor, Pergammon Press, 1980.

RECENT PRESENTATIONS

- Rocky Mountain Analytical Conference, August, 1991. - Symposium organizer and Chairman
- LUST/UST Methodology Symposium, July 1990. - Organizer and Chairman
- Rocky Mountain Analytical Conference, August 1990. - Determination of Organochlorine Pesticides in Serum. Elizabeth D. Sexton, Yvonne K. Herman, Lann A. Smith. - A Rapid Method for the Determination of Alkylphosphonates in Water and Soil. Ruben Abril-Dominguez, Elizabeth D. Sexton, Andrew W. Law.
- Pittsburgh Conference, February 1988. - Supercritical Fluid Chromatography of Azo Dyes. Elizabeth D. Sexton and Steven M. Pyle.
- ACS Regional Meeting, March 1988. - Determination and Speciation of As(III) and As(V). Daniel C. Fisher and Elizabeth D. Sexton. - Determination of Silylated Amines on Derivatized Silica Gel. Elizabeth D. Sexton, Irene M. Farnham, David Gottlieb, and Maheshkumar H. Patel.

AFFILIATIONS

Environmental and Analytical Division, American Chemical Society Chairman,
Boulder Dam Section, American Chemical Society
Colorado Alliance for Science

TRAINING

Supervisory Certificate Program, Colorado State Personnel Department.
Management and Supervision Training, Certificate Received 1990.
"Interact" conflict resolution Colorado State Personnel Department. 1989.
Supercritical Fluid Chromatography Training Course. Lee Scientific 1988.
QA training course, USEPA Solid Waste Symposium, taught by Dr. John Taylor. 1987
GC Troubleshooting and Maintenance, Hewlett-Packard, 1993

12.3 WILLIAM M. WHITON

- Operations Manager for Chemistry
- B.S. Geology, B.S. Physical Science
  Ft. Lewis College, Dur3ngo, Colorado
- 40 Hour OSHA Trained (29 CFR 1910.120)

AREAS OF EXPERIENCE

Gas Chromatography - Detectors: PID, FID, FPD, TCD, ECD, and ELCD, US EPA Methods: 8020, 8140, 608, 8080, Analysis For: Herbicides, Pesticides, PCB's, BTEX, Hydrocarbon I-D, Sulfur Gases, MTBE, TVH, GC/MS - US EPA Methods: 524, 624, 8240, 8270, 525, 625, Analysis For: Volatile and semi-volatile organics, Extractions For: PCB's, Herbicides, Pesticides, BNA's

TRAINING

- GC/MS Instrumentation and Interpretation University of Colorado Medical Center, Denver, Colorado
- Capillary Chromatography Hewlett-Packard Training Center, Denver, Colorado
- Basic Principles of Gas Chromatography, Colorado School of Mines, Golden, Colorado

GEOGRAPHICAL LOCATIONS OF SIGNIFICANT EXPERIENCE

Colorado, Oklahoma, Texas, Wyoming, Kansas, Ohio, Utah

BEFORE JOINING GEO ENVIRONMENTAL IN 1990

- Core Laboratories - Chemist/Chromatographer
- Hager Laboratories - Extractions Chemist, GC/MS Operator
- OEA Aerospace - Mass Spectrometer Operator
- Analex - Gas Chromatographer Training Manager, Soil Vapor Surveys Director/Chromatographer

AFFILIATIONS

- Association of Ground Water Scientists and Engineers
- The Colorado Hazardous Waste Management Society

12.4 Mark Hayes

- Principal Chemist
- B.S. Biology, Minor in Chemistry,
- Metropolitan State College, Denver, 1988
- 40 Hour OSHA Trained (29 CFR 1910.120)

AREAS OF EXPERIENCE

GC/MS, GC, environmental analysis and extraction procedures, quality control and quality assurance especially as they relate to Contract Laboratory protocol; supervision of technicians and chemists; troubleshooting and setting up laboratory equipment; sat on advisory board for petroleum product analysis for the Department of Environmental Quality for the State of Alaska.

BEFORE JOINING GEO ENVIRONMENTAL

- Analytica-Alaska Incorporated -- Lab Manager
- Analytica Incorporated, Golden,Colorado -- GC/MS Operator GC Analyst, Organic and Inorganic Preparation Technician
- U.S. Navy -- Special Forces Group/Beach Master Unit

TRAINING

- GC/MS Instrumentation and Interpretation, ACS Training course, 1991

12.5 ADAM P. MacDONALD

- Senior Geochemist/Project Manager
- B.S. Geology, University of New Hampshire
- Graduate School, University of Colorado (Boulder)
- 40 Hour OSHA Trained (29 CFR 1910.120)

AREAS OF EXPERIENCE

VAX/VMS computerized oil well analysis, stratigraphic data base compilation, site and laboratory safety coordinator, stratigraphic computer modeling, computerized structural horizon mapping, computerized thickness mapping, and well site consulting, GC operator and interpretation, soil horizon classification

GEOGRAPHICAL LOCATIONS OF SIGNIFICANT EXPERIENCE

Wyoming, Colorado, Kansas, New Hampshire, Arizona, North Dakota, Oklahoma, Texas, Utah, New Mexico

BEFORE JOINING GEO ENVIRONMENTAL

- GEO Corporation - Wellsite Geologist
- Analex (Division of XCO of Colorado) - Logging Analyst, Wellsite Consultant
- RPIU International, Inc. - Oil and Gas Specialist

12.6 JOHN RINKER

- Field Chemist/Project Manager
- B.A. Chemistry, University of Florida, Gainesville
- 40 Hour OSHA Trained (29 CFR 1910.120)
- 40 Hour OSHA Training Update

AREAS OF EXPERTISE

EPA SW-846 sampling protocol, regulatory compliance, chemical segregation and lab packing. Project management, waste minimization. Technical report writing, Haz/Cat waste and L.S.A radioactive waste characterization. Organics analysis by GC, computer applications.

BEFORE JOINING GEO ENVIRONMENTAL

- Environmental Scientist, Environmental Chemical Corporation, Denver, CO
- Technical Sales Representative, Ecology Recovery Company, Denver, CO
- Hazardous Waste Coordinator, Ecoflo, Greensboro, NC
- Laboratory Intern, NIST, Gaithersburg, MD

12.7 CHARLES ISBON

- Field Chemist/Project Manager
- B.S. Geology, B.A. Mathematics, University of Texas, Arlington
- 40 Hour OSHA Trained (29 CFR 1910.120)

AREAS OF EXPERTISE

Organics analysis by GC, including BTEX, petroleum products, chlorinated solvents. Supercritical fluid extraction, total petroleum hydrocarbons by infrared spectrometry. Well site geology, soil lithology.

BEFORE JOINING GEO ENVIRONMENTAL

- Consultant, GEO Corporation, Denver, CO
- Consulting Geologist, Analex, Denver, CO
- Well Site, Logging Consultant, X-Pert Logging

12.8 NATALIE POPIEL

- Field Chemist/Project Manager
- B.A. Biology, University of Colorado, Denver
- 40 Hour OSHA Trained (29 CFR 1910.120)

AREAS OF EXPERTISE

EPA SW-846 protocol, technical report writing. Organics analysis by GC, computer applications. Supercritical fluid extraction, total petroleum hydrocarbons by infrared spectrometry. Inorganic analysis of water and soil samples.

BEFORE JOINING GEO ENVIRONMENTAL

- Laboratory Scientist, Accu-Labs Research, Golden, CO
- Academic Tutor, Center for Learning Development, UCD, Denver, CO

12.9 HEATHER ESBENSON

- Field Chemist/Project Manager
- B.A. Biology, Psychology, University of Colorado, Boulder
- 40 Hour OSHA Trained (29 CFR 1910.120)

AREAS OF EXPERTISE

EPA SW-846 protocol, standards preparation and documentation. Writing SOP's, method detection limit studies. Involved in performance evaluation standards, stock inventory, GC volatile analysis with purge and trap sample introduction, semi-volatile analysis.

BEFORE JOINING GEO ENVIRONMENTAL

- Standards Prep Chemist, Rocky Mountain Analytical, Arvada, CO
- GC Semi-Volatile Analyst, Rocky Mountain Analytical
- GC Volatile Analyst, Rocky Mountain Analytical
- GC Volatile Analyst, Phoenix Analytical Laboratory
- Research Assistant, University of Colorado, Boulder

13.0 NELSON ROWE

- Field Chemist/Project Manager
- B.A.S. Biology, Chemistry Minor, University of Southern Maine
- 40 Hour OSHA Trained (29 CFR 1910.120)

AREAS OF EXPERTISE

EPA SW-846 protocol, GC analysis of volatile and semi-volatile analytes. Waste segregation and classification, disposal coordination, lab packing, labelling and manifesting. Regulatory compliance. Usage of purge and trap sample introduction, semi-volatile extraction.

BEFORE JOINING GEO ENVIRONMENTAL

- Field Chemist, Environmental Compliance, Denver, CO
- Field Chemist, Laidlaw Environmental Services, Charleston, South Carolina
- Engineering Aid, McClearn/Chemrisk, Portland, Maine
- Laboratory Supervisor, Deering Ice Cream, Portland, Maine
- Phlebotomy Lab Assistant, Mercy Hospital, Portland, Maine
- Environmental Testing Technician, Northeastern Semiconductor, Portland Maine
- Quality Control Lab Technician, Petro Chemicals, Inc., Fort Worth, Texas

CERTIFICATIONS

PHB Technician by National Certification Agency for Lab Technicains
CPR Instructor, American Red Cross
Open Water Navigation
Qualified Submarine Service
Open Water Diving

13.1 JEFFREY SNYDER

- Field Chemist
- B.S. Geology, University of North Dakota
- 40 Hour OSHA Trained (29 CFR 1910.120)

AREAS OF EXPERTISE

EPA SW-846 protocol, technical report writing. Organics analysis by GC, computer applications. Total petroleum hydrocarbons by gas chromatography.

BEFORE JOINING GEO ENVIRONMENTAL

- Scanning Electron Microscope and X-Ray Diffraction Operator
  Natural Materials Laboratory, University of North Dakota
- Teaching Assistant, Geology Department, UND
  Denver, CO

13.2 STEVEN MCLEAN

- Field Chemist
- B.S. Geology, University of North Dakota
- 40 Hour OSHA Trained (29 CFR 1910.120)

AREAS OF EXPERTISE

EPA SW-846 protocol, technical report writing. Organics analysis by GC, computer applications. Petroleum hydrocarbons analysis by gas chromatography, polynuclear aromatic hydrocarbons by liquid chromatography.

BEFORE JOINING GEO ENVIRONMENTAL

- Scanning Electron Microscope and X-Ray Diffraction Operator Natural Materials Laboratory, University of North Dakota
- Teaching Assistant, Geology Department, UND
- Bridge Crew Member, State of North Dakota
- Farm Laborer, David McLean Farm

13.3 JAY SILER

- Field Chemist
- B.S. Geology, University of Oklahoma
- 40 Hour OSHA Trained (29 CFR 1910.120)

AREAS OF EXPERTISE

EPA SW-846 protocol, technical report writing. Organics analysis by GC. Petroleum hydrocarbons analysis by gas chromatography, total recoverable hydrocarbons by infrared spectroscopy.

BEFORE JOINING GEO ENVIRONMENTAL

- Laboratory Technician, University of Oklahoma, Norman, OK
- Hydrologist, Association for Central Oklahoma Governments
- Roughneck, Lee Jones Construction, Tonkawa, Oklahoma
- Heavy Equipment Operator, Getty Mine, Shirley Basin, Wyoming

13.4 JERALD W. WERTH

- Technical Services Manager
- Denver Institute of Technology
- Radiation Technician
- Nuclear Weapons Training-Group Pacific
- Nuclear Weapons Training-Group Atlantic
- Norfolk Naval Advanced Shipboard Fire Fighting
- 40 Hour OSHA Trained (29 CFR 1910.120)
- First Aid and CPR Trained

AREAS OF EXPERIENCE

Air, water, and soil sampling - Hazardous categorization - Site remediation - Radiation monitoring - Drum handling and sampling - Lab packing - Respirator maintenance - Confined space entry - Site layout and contamination control - operation of field surveying equipment - Disposal of hazardous material - Operate heavy equipment - Worked in conjunction with the U.S. Coast Guard on radiation sites performing remediation, emergency response, and RAD monitoring.

GEOGRAPHICAL LOCATIONS OF SIGNIFICANT EXPERIENCE

Colorado, Wyoming, Utah, New Mexico, Montana, California, Virginia, West Virginia, New Jersey, North Carolina, and Arizona. U.S. Naval Sites: Puerto Rico, St. Thomas, Spain, France, Mexico, and Turkey

BEFORE JOINING GEO ENVIRONMENTAL IN 1991

- Riedel Environmental Services, Pollution Control Specialist
- United States Navy, Nuclear Weapons Technician
- Holiday Inn, Stationary Engineer/Primary Mechanic

13.5 Rolf Larsen

- Environmental Technician--Salt Lake City
- 40 Hour OSHA Trained (29 CFR 1910.120)
- 8 Hour OSHA Supervisor Training
- Red Cross 3 Year First Aid Certificate
- CPR Annual Training
- USAF Electronic Troubleshooting and Repair

Areas of Experience

Drilling and sampling using Stanley sinker and Giddings augur drills. Well installation and Federal, State and Local regulations related to installation and monitoring. Sampling protocols, project Health and Safety Plans. Phase I site investigations. Supervised underground storage tank removals and well abandonment projects. Set-up and maintenance of air strippers and vapor extraction systems.

Before Joining GEO Environmental in 1992

- Harding Lawson Associates
- Gallop Georesources, Inc.
- ITT Corporation, Avionics Division
- Purdy Corporation
- Lapointe Industries

13.6 PHILIP MCELHINNEY

- Regional Manager -- Great Lakes Region
- 40 Hour OSHA Trained (29 CFR 1910.120)
- B.A. History, Pepperdine University

Areas of Experience

Drilling and sampling using Stanley sinker and Giddings augur drills. Well installation and Federal, State and Local regulations related to installation and monitoring. Sampling protocols, project Health and Safety Plans.

Before Joining GEO Environmental in 1993

- Bush-Quayle National Campaign Headquarters 1992
- The Ronald Reagan Foundation
- Aleutian Dragon Fisheries

APPENDIX D-2

FIELD AUDIT RESULTS

Figure VII-12-1. Field Audit Form, RCRA Facility Investigation, Pekin, Illinois Service Center.

FIELD AUDIT

Auditor: Jack Bedessem

Date: 8/11/94

Location: Pekin, IL

Project: Safety-Kleen Corp

Activity: Phase I RFI

Field Personnel

Site Manager: Tom Nissen

Site Health and Safety Officer: Charlie DeWolf

Field Staff: Tom Nissen, Charlie DeWolf, Mark Giatras, Steve Grace

Health and Safety

PID: Precision Check (±30%) Check Daily Instrument Logs 8/9-10/94 ok

Accuracy Check (±5%) Check Daily Instrument Logs 8/9-10/94 ok

Explosimeter: Precision Check (±30%) Check Daily Instrument Logs 8/9-10/94 ok

Accuracy Check (±5%) Check Daily Instrument logs 8/9-10/94 ok

Draeger Tubes: None Used During Project

Personnel Protection Equipment: Hard Boots, Disp. Gloves, Safety Glasses, Ear Protection - Ok

Incidents: None Reported, Observed or Noted.

Responses: N/A

Noncompliances with Plan: None Reported Observed or Noted

Monitoring Procedures

Sampling Procedure Noncompliance: See Notes - Next Page

Decontamination Procedure Noncompliance: TN, CD indicated procedures followed per plan. EDD decontamination procedures observed according to plan.

Field Documentation Noncompliance: Field forms, borehole logs, complete and accurate. Supplemental information needs to be completed on several BH logs. (i.e. site name, drilling equipment, quad., location, etc.).

Label Noncompliance: Sample labels complete for samples collected to date.

Chain-of-Custody/Sample-Analysis-Request: COC/SAR complete for samples collected to date

Noncompliance: None reported, observed or noted which would compromise objectives See Notes.

Completeness

SWMU Samples: Ok

Background Samples: See Notes

Field Duplicate (1/10): Ok - RFI-20, RFI-21

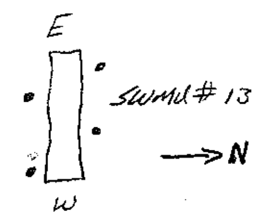
Noncompliances with Plan: None reported, observed or noted which would compromise objectives. See Notes

Thomas C. M[illegible] 8/11/94
Site Manager, Company, Date

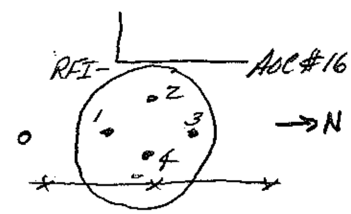
[illegible] 8/11/94
Auditor, Company, Date

Notes

1. Plan specified collection of 3 samples from immediately below SWMU #13. This SWMU is containment trench for operating DSA. S-K concerned with drilling through secondary containment. Consulted with IEPA personnel and decided to install four boreholes around SWMU #13.



2. Field team check with onsite personnel regarding location of AOC #16 (Past Oil Spill). Sited and constructed four boreholes. RFI #1 was the only Borehole which encountered fill material. TN indicated others appeared to be native material. Constructed another boring to south approximately 30 feet to check for fill material. Resultant sample appeared to be native. Therefore spill area may be smaller than originally documented.



3. RFI workplan specified collection of background samples. IEPA approval letter requested background samples not be collected until after extent has been defined. Field results indicated extent; therefore, S-K planning to collect background samples per plan.

APPENDIX D-3

SAFETY-KLEEN ENVIRONMENTAL LABORATORY STANDARD OPERATING PROCEDURE FOR TPH ANALYSES

TITLE: **STANDARD OPERATING PROCEDURE FOR THE DETERMINATION OF MINERAL SPIRITS IN SOIL OR WATER BY GAS CHROMATOGRAPHY**
(KEYWORDS: MINERAL SPIRITS, GAS CHROMATOGRAPHY, SOIL, WATER)
(based on EPA method 8015)

1. SCOPE AND APPLICATION

1.1 This method is for the determination of mineral spirits in various environmental matrices. This method is capable of determining mineral spirits in a mixture of other hydrocarbons by pattern recognition.

2. SAFETY AND WASTE HANDLING

2.1 **Eye Contact** - Safety glasses with eye shields must be worn when working in the laboratory.

2.2 **Hand Contact** - Use of disposable vinyl or latex gloves provide adequate protection from contact with the samples. Gloves should be changed immediately upon coming in contact with samples. All skin contact must be washed off immediately.

2.3 **Respiratory** - Exposure to the vapors from the sample should be kept to a minimum by working in a well-ventilated area.

2.4 Analyst must be aware of MSDS for all chemicals used in the lab.

2.5 **Waste Disposal** - The sample is stored, refrigerated, for future testing and later disposal. Standards are placed in the waste solvent container for disposal.

Contaminated wipes are placed in a metal container that has been lined with a plastic trash bag. A metal top must be kept on the container at all times except to add or remove the contents.

3. SUMMARY OF METHOD

A sample is extracted with methylene chloride and concentrated. The concentrate is then injected onto a gas chromatograph equipped with a Flame Ionization Detector. The amount of mineral spirits present is determined by comparing the sample chromatogram with a standard of known concentration.

4. SAMPLE HANDLING AND PRESERVATION

4.1 Samples are received from the field cooled. Upon receipt samples are placed in the sample refrigerators at 4°C.

4.2 Sample extracts are maintained at 4°C until analysis.

4.3 Soil samples are to be extracted within 14 days of collection. Water samples are to be extracted within seven days of collection.

5. INTERFERENCES

5.1 Interferences coextracted from the samples will vary considerably from source to source. The analytical system, however, is checked to ensure freedom from interferences, under the analysis conditions, by analyzing method blanks.

5.2 Cross-contamination can occur whenever high-level and low-level samples are analyzed sequentially. Whenever an unusually concentrated sample is analyzed, the sample immediately following should be re-analyzed if a positive result for an analyte in the prior sample is obtained. The gas chromatographic system may require extensive bake-out and cleaning after a high-level sample. When possible, high level samples should be screened on a different GC to allow dilution prior to analysis.

5.3 All solvents are to be kept in the hood and tightly closed.

5.4 The analytical system must be demonstrated to be free from contamination under the conditions of the analysis by running laboratory reagent blanks.

. APPARATUS and CHEMICALS

NOTE: Unless indicated as mandatory, all references to manufacturer and catalog number are provided as examples of acceptable items.

6.1 **Syringe:** 10 ul, 25 ul, 50 ul, 100 ul, 250 ul, 500 ul, 1.0 ml, 5.0 ml, gas tight.
6.2 **Balance:** Analytical, capable of accurately weighing 0.0001 g, and a top-loading balance capable of weighing 0.1 g.
6.3 **Glass scintillation vials:** 20-ml, with screw caps and Teflon liners or glass culture tubes with a screw cap and Teflon liner
6.4 **Volumetric flasks:** 2 ml, 5 ml, 10 ml and 100 ml, class A with ground-glass stoppers.
6.5 **Vials:** 0.5 ml, 1.0 ml and 2 ml vials for standards
6.6 **Spatula:** Stainless steel.
6.7 **Disposable pipettes:** Pasteur.
6.8 **Mortar & Pestle**
6.9 **Teflon Funnels:** 1 liter
6.10 **Kuderna Danish:** 3-ball Snyder Column, 10 ml receiver.
6.11 **Amber vials:** 10.0 ml capacity with Teflon caps.
6.12 **Sodium Sulfate:** baked at 400°C for 16 Hr.
6.13 **Sakrete all purpose sand:** baked at 500°C for 16 Hr. for soil blanks
6.14 **Amber bottles:** 500 ml capacity, Teflon caps
6.15 **Ortho-Terphenyl:** surrogate
6.16 **Methylene Chloride**
6.17 **Gas chromatographic system:**

6.17.1 Gas chromatograph: HP-5980 Series II or equivalent with capillary injection system.

6.17.2 Column: Rtx-5, 25 meter by 0.32 mm ID 1.0 micron Film thickness or equivalent.

6.17.3 Data system: HP Chemstation operating on a 386 personal computer, or equivalent.

6.17.4 GC temperature program:
Injection port: 250°C
Detector temperature: 300°C
Oven temperature program: 40°C for 4.0 min.
Ramp 1: 15°C/min. to 250°C
Ramp 2: 20°C/min. to 300°C for final time of 20.0 min.
1 ul injection

7. REAGENTS/STANDARDS

NOTE: All reagents must have the following clearly identified:

Container	and/or	Logbook
____ Description		____ Description
____ Source		____ Source
____ Lot #		____ Lot #
____ Purity		____ Purity
____ Date of Receipt		____ Date of Receipt
____ Date Opened		

NOTE: If purity is not known, record the grade.

Standards and all solutions must have the following clearly identified:

Container:	Logbook:
____ Description	____ Standard/Solution Name
____ Nominal Concentration	____ Source
____ Date Prepared	____ Lot #
____ Expiration Date	____ Purities
	____ Concentrations
	____ Preparer's Name
	____ Date of Preparation
	____ Expiration Date

NOTE: If purity is not known, record the grade.

8. PREVENTIVE MAINTENANCE

8.1 Every 50 to 75 injections replace septa and liner.

8.2 All maintenance must be recorded in maintenance log.

9. TROUBLESHOOTING/CORRECTIVE ACTION

9.1 If peak tailing occurs, the first three inches of the injection end of the column is to be clipped, and the injection liner changed.

9.2 If the area of the standard is low or no peaks are detected the septa needs to be replaced. Change the liner when the septa is changed.

9.3 To remove contamination remove 3 - 4" from injection side of column, replace septa and liner. Bake at 300°C. If retention gap is used remove 3" - 4" from injection end of retention gap instead of from the column.

10. QUALITY CONTROL

10.1 A five point calibration curve is run with standards in the range of interest. Example: 2, 5, 10, 25, 50, 100, and 200 ppm.

10.2 A independent calibration check (CCS)is run before, and after every 20 samples. The standards must agree within 20% of each other. If the standards are not within 20 % all samples between the standards must be re-run.

10.3 A blank and a blank spike is to be prepped with every batch of samples. If a quantifiable amount of mineral spirits is detected in the blank, samples between the blanks are to be reanalyzed.

10.4 A sample is to be chosen as a matrix spike/matrix spike duplicate with every batch of samples prepped, or every 20 samples whichever is more frequent. The sample is spiked at about 25 ppm. (example: 140 ul of a 1814 ppm solution.)
If the RPD is greater than 20% the cause must be determined, corrected or the sample is re-prepared.

10.5 A blank sample of methylene chloride is to be run before every GC sequence. If a quantifiable amount of mineral spirits is detected in the blank, the samples between the blanks are to be reanalyzed. (see sec. 5.2)

10.6 Ortho-Terphenyl is used as a surrogate.

11. PROCEDURE

11.1 Pre-rinse all glassware with methylene chloride prior to use.

11.2 Extraction of Water Samples
Take 500 ml of sample and put into a 1 liter separatory funnel.
Spike surrogate to a final concentration of 10 ppm in 10 mls of extract. (example: 50 ul of a 2000 ppm solution.)
Extract three times with 100 ml of methylene chloride, combining extracts in an amber bottle.
Filter extracts through Whatman 40 filter paper with about 30 gms of sodium sulfate into a Kuderna-Danish Flask.
Concentrate to approximately 5-7 ml, and cool.
Make up volume to 10.0 ml and transfer to amber vial.

11.3 Extraction of Soil Samples
Mix 30 gms of soil with 30 gms of sodium sulfate. If soil is not free flowing add an additional 30 gms of sodium sulfate.
Spike surrogate to a final concentration of 25 ppm in 10 mls of extract. (example: 125 ul of a 2000 ppm solution.)
Sonicate three times with 100 ml of methylene chloride for 3 minutes each time. Combine extracts in an amber bottle.
Filter extract through Whatman 40 filter paper with approximately 30 gms of sodium sulfate into a Kuderna-Danish flask.
Concentrate to approximately 5-7 ml, and cool.
Make up volume to 10.0 ml, and transfer to amber vial.

.1.4 GC Analysis:

A typical GC sequence would be:
1. GC methylene chloride blank
2. Independent CCS
3. Prep Blank
4. Prep Blank Spike
5. Sample
6. Sample matrix spike
7. Sample matrix spike dup.
8-26. Samples
27. GC methylene chloride blank
28. Independent CCS

The area where mineral spirits elutes must be free of any peaks above the MDL for the methylene chloride blank, and the response factor of the CCS must agree within 20% of the average response factor of the five point.

A GC blank and CCS must be run after every 20 sample or at the beginning and end of a chromatographic run.

11.5 Data Analysis

11.5.1 Qualitative Analysis: All material eluting in the same range as the mineral spirits standard is compared to patterns of gasoline, kerosene, and diesel fuel. Material eluting in the same range as the mineral spirits standard is assumed to be mineral spirits unless it matches one of the above standard patterns.

11.5.2 Quantitative Analysis: The area of all peaks eluting in the mineral spirits range is summed.

Material eluting after the surrogate is assumed to be oil.

Material eluting after mineral spirits, and before the surrogate is assumed to be medium hydrocarbons(MHC). Typically MHC can be oil, kerosene, and/or diesel fuel.

12. QUANITATION

12.1 The amount of mineral spirits(MS) in the sample is quantitated using the response factor of the continuing CCS standard. Oil and MHC are estimated from the same response factor.

The response factor(RF) is determined by dividing the amount of the CCS standard by the area of the CCS standard.

Mineral spirits amount(mg/l)=
Area MS X RF(MS) X (ml extract final volume/ml sample extracted*)
*Note: for soils substitute the wt.(gms.) of sample extracted

13. REFERENCES

13.1 SW-846 Third Edition, September 1986.

13.2 California Total Petroleum Hydrocarbons Method.

APPENDIX E

BOREHOLE LOGS
RFI PHASE I RELEASE ASSESSMENT
PEKIN SERVICE CENTER

Illinois Environmental Protection Agency — Field Boring Log

Site File No. 1790600011 County Tazewell Boring No. RFI-1 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 495.3 Completion Depth 8.0

Fed. ID. No. ILD-093-862-811 Auger Depth 8.0' Rotary Depth NA

Quadrangle Pekin, Il Sec. 15 T. 24 N R. 5 E Date: Start 8/10/94 Finish 8/10/94

UTM Coord. N. ______ E. ______

Boring Location AOC 16, S

Drilling Equipment Scorpion Hyd. Probe

Personnel:
- G - T. Nissen
- D - Mark Yiatras
- H - Steve Grace
- H - C. DeWolf

Elev.	DESCRIPTION	Graphic Log	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	0-2.0 SILTY LOAM (ML/OL), brown, sandy, first 18".					75			0	
494.3			1							
493.3	2.0-4.0 SILTY LOAM (ML/OL), brown, as above.		2			75			0	Sampled as per IEPA letter
492.3			3							
491.3	4.0-6.0 SAND (SP), medium grained, tan-brown. Quartz predominant with approximately 10% feldspar and other fragments.		4			75			0	Sampled per double zeros
490.3			5							
489.3	6.0-8.0 SAND (SP) as above.		6			75			0	
488.3			7							
487.3			8							TD = 8'
										Duplicate RFI-20 (6-8) taken in offset hole of RFI-1 Is duplicate of RFI-1 (2-4)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. 1790600011 County Tazewell Boring No. RFI-2 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 495.3 Completion Depth 6.0

Fed. ID. No. ILD-093-862-811 Auger Depth 6.0' Rotary Depth NA

Quadrangle Pekin, Il Sec. 15 T. 24 N R. 5 E Date: Start 8/10/94 Finish 8/10/94

UTM Coord. N. ______ E. ______

Boring Location AOC 16, W

Drilling Equipment Scorpion Hyd. Probe

Personnel
G - T. Nissen
D - Mark Yiatras
H - Steve Grace
H - C. DeWolf

Elev.	DESCRIPTION	Graphic Log	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	0-2.0 SILTY LOAM (ML/OL), brown, with some roots, dry.					75			1.3	
494.3			1							
493.3	2.0-4.0 SANDY SILTY LOAM (ML/OL), brown, dry.		2			75				
492.3			3							
491.3	4.0-6.0 SAND (SP), medium to coarse. Primarily quartz with approximately 20% feldspar and lithic fragments same as RFI-1.		4			75			0.7	
490.3			5							
489.3			6						1.0	TD = 6'

Illinois Environmental Protection Agency — Field Boring Log

Site File No. 1790600011 County Tazewell Boring No. RFI-3 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 495.3 Completion Depth 6.0

Fed. ID. No. ILD-093-862-811 Auger Depth 6.0' Rotary Depth NA

Quadrangle Pekin, Il Sec. 15 T. 24 N R. 5 E Date: Start 8/10/94 Finish 8/10/94

UTM Coord. N. E.

Boring Location AOC 16, N

Drilling Equipment Scorpion Hyd. Probe

Personnel:
- G - T. Nissen
- D - Mark Yiatras
- H - Steve Grace
- H - C. DeWolf

Elev.	DESCRIPTION	Graphic Log	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	0-2.0 SILTY LOAM (ML/OL), brown, crumbly, with roots.		0			75			1.4	
494.3			1							
493.3	2.0-4.0 SILTY LOAM (ML/OL), slightly sandy, brown, as above.		2			75			1.0	
492.3			3							
491.3	4.0-6.0 SAND (SP), coarse 60%, medium and fine 20% each. Tan-brown, abundant lithic fragments and feldspar.		4			75			1.1	
490.3			5							
489.3			6							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. 1790600011 County Tazewell Boring No. RFI-4 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 495.3 Completion Depth 6.0

Fed. ID. No. ILD-093-862-811 Auger Depth 6.0' Rotary Depth NA

Quadrangle Pekin, Il Sec. 15 T. 24 N R. 5 E Date: Start 8/10/94 Finish 8/10/94

UTM Coord. N. ______ E. ______

Boring Location AOC 16, E

Drilling Equipment Scorpion Hyd. Probe

Personnel
G - T. Nissen
D - Mark Yiatras
H - Steve Grace
H - C. DeWolf

Elev.	DESCRIPTION	Graphic Log	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	0-2.0 CLAYEY SILTY LOAM (ML/OL), lightly moist, brown, soft semi-crumbly, dark.					63			2.2	
494.3			1							
493.3	2.0-4.0 SILTY LOAM and SAND (ML/SM), dark brown, moist.		2			66			1.3	
492.3			3							
491.3	4.0-6.0 SAND (SP), coarse to medium, dark brown and medium grading to tan and coarse at 5-5.5'.		4			79			1.6	
										Background on empty ziploc 0-3.0 So all TOV readings in RFI 1-4 are below background

Illinois Environmental Protection Agency — Field Boring Log

Site File No. 1790600011 County Tazewell Boring No. RFI-5 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 492.8 Completion Depth 9.0

Fed. ID. No. ILD-093-862-811 Auger Depth 9.0' Rotary Depth NA

Quadrangle Pekin, Il Sec. 15 T. 24 N R. 5 E Date: Start 8/10/94 Finish 8/10/94

UTM Coord. N. E.

Boring Location NW of former sump

Drilling Equipment Scorpion Hyd. Probe

Personnel
G - T. Nissen
D - Mark Yiatras
H - Steve Grace
H - C. DeWolf

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	0-0.5 Concrete								
491.8	1.0-3.0 SILTY LOAM (ML/OL), red brown, brittle and crumbly. Dry, no odor.	1			100			0	No sample kept
490.8		2							
489.8	3.0-5.0 SILT LOAM (ML/OL), as above. Sand at bottom 6", red fine grained (iron-stained), concrete slough in top 6".	3			42			0	Collect for lab
488.8		4							
487.8	5.0-7.0 SAND (SP/SM), fine, as above, red, dry, non-cohesive.	5			42			0	Collect for double zero
486.8		6							
485.8	7.0-9.0 SAND (SP), red, silty, poorly sorted. A few pebbles, gravel sized grains, as above. Dry, non-cohesive.	7						0	
484.8		8							
483.8		9							
									Duplicate drill to get slough-free samples

Illinois Environmental Protection Agency — Field Boring Log

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Site File No. 1790600011 County Tazewell Boring No. RFI-6 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 492.8 Completion Depth 7.0

Fed. ID. No. ILD-093-862-811 Auger Depth 7.0' Rotary Depth NA

Quadrangle Pekin, Il Sec. 15 T. 24 N R. 5 E Date: Start 8/10/94 Finish 8/10/94

UTM Coord. N. ______ E. ______

Boring Location SE of former sump, center room of building

Drilling Equipment Scorpion Hyd. Probe

Personnel:
G - T. Nissen
D - Mark Yiatras
H - Steve Grace
H - C. DeWolf

Elev.	Description	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	Remarks
	0-0.5 Concrete								Ambient TOV = 1.1
491.8	1.0-3.0 SILT LOAM (ML/OL), gray brown grading to red-brown, soft, moist, plastic to crumbly.	1			75			1.0	
490.8		2							
489.8	3.0-5.0 SAND (SM) brown to red-brown, loamy, silty, fine-grained, slightly cohesive, moist, soft.	3			50			3.4	
488.8		4							
487.8	5.0-7.0 SAND (SP), brown, arkosic fine to coarse grained, some pebbles, loose, moist.	5			50			3.4	
486.8		6							
485.8		7							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. 1790600011 County Tazewell

Boring No. RFI-7 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL

Surface Elev. 492.8 Completion Depth 8.0

Fed. ID. No. ILD-093-862-811

Auger Depth 8.0' Rotary Depth NA

Quadrangle Pekin, Il Sec. 15 T. 24 N R. 5 E

Date: Start 8/10/94 Finish 8/10/94

UTM Coord. N. ______ E. ______

Boring Location S of trench, east boring.

Drilling Equipment Scorpion Hyd. Probe

Personnel
G - T. Nissen
D - Mark Yiatras
H - Steve Grace
H - C. DeWolf

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	0-0.5 Concrete	0							PID background 1.1 ppm
491.8		1							
490.8	2.0-4.0 SAND (SM/SP), tan, very little silt, medium to coarse sand with some fines (poorly sorted). Arkosic, moist.	2			17			1.1	
489.8		3							
488.8	4.0-6.0 SAND (SP), tan, as above, some pebbles up to 3/4" long, loose, moist.	4			63			1.1	
487.8		5							
486.8	6.0-8.0 SAND (SP) as above.	6			58			1.1	
485.8		7							
484.8		8							

Illinois Environmental Protection Agency — Field Boring Log

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Site File No. 1790600011 County Tazewell Boring No. RFI-8 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 492.8 Completion Depth 8.0

Fed. ID. No. ILD-093-862-811 Auger Depth 8.0' Rotary Depth NA

Quadrangle Pekin, Il Sec. 15 T. 24 N R. 5 E Date: Start 8/10/94 Finish 8/10/94

UTM Coord. N. ______ E. ______

Boring Location N of trench, east boring.

Drilling Equipment Scorpion Hyd. Probe

Personnel:
G - T. Nissen
D - Mark Yiatras
H - Steve Grace
H - C. DeWolf

Elev.	Description	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	Remarks
	0-0.5 Concrete	0-0.5							
491.8		1							
490.8	2.0-4.0 SAND (SP), red-brown, silty. Lots of concrete slough in sample.	2			8			1.1	Concrete slough, poor recovery, very loose, immediately below concrete
489.8		3							
488.8	4.0-6.0 SAND (SP/CL), Red to brown, silty, fine grained to medium grained, poorly sorted. Some clots of silty black clay mixed in, some slough in sample.	4			33			1.1	Refusal at 5', offset and resampled 4-6' for collection
487.8		5							
486.8	6.0-8.0 SAND (SP), as above with no black clay, but with minor black flecks of charcoal.	6						1.1	
485.8		7							
484.8		8							

Illinois Environmental Protection Agency — Field Boring Log

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Site File No. 1790600011 County Tazewell

Boring No. RFI-9 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL

Surface Elev. 492.8 Completion Depth 8.0

Fed. ID. No. ILD-093-862-811

Auger Depth 8.0' Rotary Depth NA

Quadrangle Pekin, Il Sec. 15 T. 24 N R. 5 E

Date: Start 8/10/94 Finish 8/10/94

UTM Coord. N. ______ E. ______

Boring Location S of trench, west boring.

Drilling Equipment Scorpion Hyd. Probe

Personnel:
G - T. Nissen
D - Mark Yiatras
H - Steve Grace
H - C. DeWolf

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	0-0.5 Concrete	0							
491.8		1							
490.8	2.0-4.0 SAND (SP), tan, poorly sorted sand. No silt, non-cohesive. Few large (1 cm) quartz pebbles.	2			13			1.1	
489.8		3							
488.8	4.0-6.0 SAND (SP), as above.	4			25			1.1	Sampled 2 additional offsets to obtain enough sample
487.8		5							
486.8	6.0-8.0 SAND (SP), light tan, as above.	6			38			1.1	
485.8		7							
484.8		8							Very difficult to get good recovery.
									Took 3 tries to get enough sample for RFI-9 (4-6)
									RFI-21 (10-12) is blind duplicate for RFI-9 (4-6)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. 1790600011 County Tazewell

Boring No. RFI-10 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL

Surface Elev. 492.8 Completion Depth 8.0

Fed. ID. No. ILD-093-862-811

Auger Depth 8.0' Rotary Depth NA

Quadrangle Pekin, Il Sec. 15 T. 24 N R. 5 E

Date: Start 8/10/94 Finish 8/10/94

UTM Coord. N. ____ E. ____

Boring Location NW end of trench

Drilling Equipment Scorpion Hyd. Probe

Personnel
G - T. Nissen
D - Mark Yiatras
H - Steve Grace
H - C. DeWolf

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	0-0.5 Concrete	0			100				
491.8		1							
490.8	2.0-4.0 SILT/LOAM (ML/OL), dark brown 2-3', SAND (SM), coarse tan 3-4'.	2			75			0	
489.8		3							
488.8	4.0-6.0 SAND (SM), tan-brown, silty, with some silty loam, dark brown.	4			50			1.1	
487.8		5							
486.8	6.0-8.0 SAND (SM), coarse, tan sand/silt loam. As above, interbedded.	6			50			1.1	
485.8		7							
484.8		8							

Illinois Environmental Protection Agency — Field Boring Log

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Site File No. 1790600011 County Tazewell Boring No. BG-1 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 492.5 Completion Depth 15.0

Fed. ID. No. ILD-093-862-811 Auger Depth 15.0' Rotary Depth NA

Quadrangle Pekin, Il Sec. 15 T. 24 N R. 5 E Date: Start 8/12/94 Finish 8/12/94

UTM Coord. N. ______ E. ______

Boring Location NW corner of old site, top of graded hill

Drilling Equipment Scorpion Hyd. Probe

Personnel
G - T. Nissen
D - Mark Yiatras
H -
H - C. DeWolf

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	0-2.5 SILT LOAM (ML/OL), black to dark brown, crumbly, root fragments.	0-2.5			50			3.5	Note - PID background variation 0-3 ppm
491.5		1							
490.5		2							
489.5	3.0-5.0 SAND (SM/SP), fine red.	3			50			2.6	
488.5		4							
487.5		5							
486.5	5.5-7.5 SAND (SP), fine red grading to fine-medium tan. Less coarse than other locations.	6			50			3.5	
485.5		7							
484.5	8.0-10.0 SAND (SP), fine red - medium tan, abundant lithic fragments.	8			50			2.6	
483.5		9							
482.5		10							
481.5	10.5-12.5 SAND (SP), fine to medium tan, well sorted "beach" sand.	11			63			2.6	
480.5		12							
479.5	13.0-15.0 SAND (SP), medium coarse, to fine, tan, not as coarse as either locations.	13							
478.5		14							
477.5		15							Duplicate of 0.5-2.5

Illinois Environmental Protection Agency — Field Boring Log

Site File No. 1790600011 County Tazewell Boring No. BG-2 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 495.3 Completion Depth 15.0

Fed. ID. No. ILD-093-862-811 Auger Depth 15.0' Rotary Depth NA

Quadrangle Pekin, Il Sec. 15 T. 24 N R. 5 E Date: Start 8/12/94 Finish 8/12/94

UTM Coord. N. ______ E. ______

Boring Location NE corner of property, 15' SW of telephone pole.

Drilling Equipment Scorpion Hyd. Probe

Personnel

G - T. Nissen
D - Mark Yiatras
H -
H - C. DeWolf

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
494.3, 493.3	0-2.5 SILT LOAM (ML/OL), dark brown to light brown, dry, crumbly, root fragments.	0–2.5			50				
492.3, 491.3, 490.3	3.0-5.0 SAND (SP), fine red, very little silt, well sorted, quartz feldspar, very few lithic fragments; clean reddish sand.	3–5			75			4.6	
489.3, 488.3	5.5-7.5 SAND (SP), fine red to tan, minor lithic fragments, no silt, well sorted.	5.5–7.5			75			3.5	
487.3, 486.3, 485.3	8.0-10.0 SAND/GRAVEL/SILT (SW/GW), fine sand coarsening to silty gravel at 9.0'. Thin 3" silt (brown) layer below (9-10'). Poorly sorted coarse sand and gravel with some silt.	8–10			75			3.5	Sampled sandy gravel for metals
484.3, 483.3	10.5-12.5 SAND/GRAVEL (SW/GW), very coarse sand and gravel. Abundant lithic fragments.	10.5–12.5			75			3.5	
482.3, 481.3, 480.3	SAND/GRAVEL (SW/GW), coarse sand, tan with major gravel, some silty sand and gravel 13-14'. Clean 14-15'.	13–15			75			2.6	

Illinois Environmental Protection Agency — Field Boring Log

Site File No. 1790600011 County Tazewell Boring No. BG-3 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 495.5 Completion Depth 36.0

Fed. ID. No. ILD-093-862-811 Auger Depth 36.0' Rotary Depth NA

Quadrangle Pekin, Il Sec. 15 T. 24 N R. 5 E Date: Start 8/12/94 Finish 8/12/94

UTM Coord. N. E.

Boring Location SE of tank basin, 5'.

Drilling Equipment Scorpion Hyd. Probe

Personnel
G - T. Nissen
D - Mark Yiatras
H - Steve Grace
H - C. DeWolf

Elev.	DESCRIPTION	Graphic Log	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
494.5	0-2.0 CLAY (CL), silty, dark, semi-malleable, slightly soft, moist.		1						0	Begin 0945 - continuous sample
493.5, 492.5	2.0-4.0 SILTY LOAM (ML/OL), brown, to dark brown, crumbly, moist.		2, 3						3.5	
491.5, 490.5	4.0-6.0 SILTY LOAM (ML/OL), as above to 5.5. Fine red sand 5.5-6.0.		4, 5			63			2.6	
489.5, 488.5	6.0-8.0 SAND (SM), fine, dark red to very dark red, moist. Minor lithic fragments.		6, 7			63			2.6	
487.5, 486.5	8.0-10.0 SAND (SP), fine dark red saturated, 8-9'. GRAVEL (GM), silty brown 9-9.5. CLAY (CL), silty brown, 9.5-10'. All moist-wet.		8, 9			63			1.7	Perched water on clay interval
485.5, 484.5	10.0-12.0 SILTY SAND/GRAVEL (SM/GW), tan, brown, moist.		10, 11			33			1.7	
483.5, 482.5	12.0-14.0 SAND (SW), coarse, brown, poorly sorted with approximately 5-10% gravel and 10-20% finer sand, moist, abundant feldspar and lithic fragments.		12, 13			50			2.6	Moisture from above?
481.5, 480.5	14.0-16.0 SAND (SW), coarse, tan, no silt, some medium but no fines. Quartz, with some feldspar and dark lithic fragments. Clean.		14, 15			75			1.7	Sample for background

Illinois Environmental Protection Agency — Field Boring Log

Site File No. 1790600011 County Tazewell Boring No. BG-3 Monitor Well No. NA

Personnel: G - T. Nissen; D - Mark Yiatras; H - Steve Grace; H - C. DeWolf

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
479.5	16.0-18.0 SAND (SW), as above.	16			58			2.6	
478.5		17							
477.5	18.0-20.0 SAND (SW), coarse tan, some fine to medium sand (30%).	18			67			1.7	
476.5		19							
475.5	20.0-22.0 SAND (SW), coarse to medium tan sand, arkosic, 10% lithic fragments.	20			75			1.7	
474.5		21							
473.5	22.0-24.0 SAND (SW), as above.	22			67			2.6	
472.5		23							
471.5	24.0-26.0 SAND (SW), tan-brown medium to coarse, some fines and silt (10 - 20%).	24			67			3.5	
470.5		25							
469.5	26.0-28.0 SAND (SW), tan, medium moist, with equal amounts of fine and coarse sand. Same relative abundance of fine and coarse 20% each.	26			63			3.5	
468.5		27							
467.5	28.0-30.0 SAND (SW), as above, moist.	28						2.6	
466.5		29							
465.5	30.0-32.0 SAND (SW), as above, moist.	30			75			3.5	
464.5		31							
463.5		32							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. 1790600011 County Tazewell Boring No. BG-3 Monitor Well No. NA

Personnel
G - T. Nissen
D - Mark Yiatras
H - Steve Grace
H - C. DeWolf

Elev.	DESCRIPTION	Graphic Log	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	32.0-34.0 SAND (SW), as above, moist.					75			2.6	
462.5			33							
461.5			34							
	34.0-36.0 SAND (SP), fine-medium tan sand, finer than above, with 10% gravel fragments poorly sorted.					63			3.5	
460.5			35							
459.5			36							
										Duplicate 4-6 for sample 1120

Illinois Environmental Protection Agency — **Field Boring Log**

Site File No. 1790600011 County Tazewell Boring No. EOD-9 Monitor Well No. NA

Site File Name Safety-Kleen Corp., Pekin Service Center, Pekin, IL Surface Elev. 494.5 Completion Depth 36.0

Fed. ID. No. ILD-093-862-811 Auger Depth 36.0' Rotary Depth NA

Quadrangle Pekin, Il Sec. 15 T. 24 N R. 5 E Date: Start 8/11/94 Finish 8/11/94

UTM Coord. N. ______ E. ______

Boring Location N of old warehouse building.

Drilling Equipment Scorpion Hyd. Probe

Personnel:
- G - Tom Nissen
- D - Mark Yiatras
- H - Steve Grace
- H - C. DeWolf

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	0-2.5 SILT LOAM (ML/OL) black-dark brown.	0			50			0	Collect for background
493.5		1							
492.5	SAND (SM), fine red.	2			75			0	Collect for background
491.5		3							
490.5		4							
489.5	5.0-7.0 SAND (SP), fine red with charcoal fragments.	5			75			0	
488.5		6							
487.5	7.5-9.5 SAND (SP), fine, red, grading to coarse tan.	7			75			0	
486.5		8							
485.5		9							
484.5	10.0-11.5 SAND (SW), coarse, tan, poorly sorted, no silt, transition to silt at 11.5'.	10			75				
483.5	11.5-12.0 SILT (ML), light brown, clayey, stiff, somewhat crumbly.	11						0	
482.5	12.5-14.5 SAND (SW), coarse, tan poorly sorted, non-cohesive, no silt, no evidence of impact.	12			75			0	
481.5		13							
480.5		14							
479.5		15							

Illinois Environmental Protection Agency — **Field Boring Log**

Site File No. 1790600011 County Tazewell Boring No. EOD-9 Monitor Well No. NA

Personnel:
G - Tom Nissen
D - Mark Yiatras
H - Steve Grace
H - C. DeWolf

Elev.	DESCRIPTION	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	15.0-17.0 SAND (SW), coarse, tan, with lenses of finer sand with minor silt content.	15-17			75			0	
478.5		16							
477.5		17							
476.5	17.5-19.5 SAND (SW), coarse tan, coarser than above fines in top of sampler, probably slough.	18			75			1.4	
475.5		19							
474.5		20							
473.5		21							
472.5		22							
471.5		23							
470.5		24							
469.5	25.0-27.0 SAND (SW), coarse, tan as above.	25			75			1.4	PID baseline variation 1.4-4.3
468.5		26							
467.5		27							
466.5		28							
465.5		29							
464.5	30.0-32.0 SAND (SW), coarse, tan. Some pebbles.	30			75			1.4	
463.5		31							
462.5		32							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. 1790600011 County Tazewell Boring No. EOD-9 Monitor Well No. NA

Personnel
G - Tom Nissen
D - Mark Yiatras
H - Steve Grace
H - C. DeWolf

Elev.	DESCRIPTION	Graphic Log	Depth in feet	Sample No.	Sample Type	Sample Recovery (%)	Pocket Penetrometer (tsf)	N Values (Blows)	OVA or PID readings (ppm)	REMARKS
	32.0-34.0 SAND (SW), as above, moist, possibly saturated.					75				
461.5			33							
460.5	34.0-36.0 SAND (SW), as above, moist, possibly saturated.		34			75			1.4	
459.5			35							
458.5			36							

USEPA

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

ary A. Gade, Director
2200 Churchill Road, Springfield, IL 62794-9276

217/524-3300

June 21, 1994

Safety-Kleen Corporation
Attn: Robert Schoepke
1000 N. Randall Road
Elgin, Illinois 60123

Re: 1790600011 -- Tazewell County
Safety-Kleen Corp.
ILD093862811
Date Received: March 3, 1994
Log No. B-96

Dear Mr. Schoepke:

The RCRA Facility Investigation (RFI) Phase I Workplan for the above-referenced facility submitted by Trihydro Corporation has been reviewed by this Agency. This workplan was submitted in accordance with Section IV Condition B of the RCRA Part B permit issued for the above-referenced facility (Log No. B-96) on March 3, 1994. The workplan is hereby approved subject to the following conditions and modifications:

1. This RFI Phase I Workplan shall be carried out to investigate for possible releases from the following solid waste management units (SWMUs):

SWMU NO.	NAME
13	Warehouse Container Storage Area Trenches
14	Warehouse Drain
16	Past Oil Spill

As stated in Section IV of the RCRA Part B Permit issued for the Safety-Kleen Corp. facility, the purpose of the required Phase I investigation is to "demonstrate conclusively whether or not hazardous wastes or hazardous constituents have been released from the SWMUs identified above. Therefore, the review of this RFI Phase I Workplan was conducted with this goal in mind.

2. RFI Phase I activities must be completed by December 1, 1994. When Phase I is complete, the owner or operator must submit to the Agency certification both by a responsible officer of the owner or operator and by an independent registered professional engineer that the facility completed Phase I in accordance with the specifications in the approved RFI Phase I workplan. In addition, a certification statement meeting the requirements of 35 IAC 702.126 must be provided by a responsible officer

of the laboratory which conducted the chemical analyses that states that the requirements of this letter were met during the chemical analyses of all samples. This certification must address the applicable sample collection, preservation, handling preparation and analytical requirements set forth in this letter. These certifications must be received at this Agency after completing Phase I, or by February 1, 1995. These dates may be extended if Safety-Kleen Corp. submits information to the Agency indicating that it is attempting to complete the required activities in a timely manner but needs additional time to complete the investigation.

The attached certification forms must be used. Signatures must meet the requirements of 35 Ill. Adm. Code Section 702.126. The independent engineer should be present at all critical, major points (activities) during the RFI. These might include soil sampling, soil removal, backfilling, final cover placement, etc. The frequency of inspections by the independent engineer must be sufficient to determine the adequacy of each critical activity.

The Illinois Professional Engineering Act (Ill. Rev. Stat., Ch. 111, par. 5105 et. seq.) requires that any person who practices professional engineering in the State of Illinois or implies that he (she) is a professional engineer must be registered under the Illinois Professional Engineering Act (par. 5101, Section 1). Therefore, any certification or engineering services which are performed for a RFI workplan in the State of Illinois must be done by an Illinois P.E.

Plans and specifications, designs, drawings, reports, and other documents rendered as professional engineering services, and revisions of the above must be sealed and signed by a professional engineer in accordance with par. 5119, Section 13.1 of the Illinois Professional Engineering Act.

As part of the certification, to document the RFI Phase I activities at your facility, please submit a Phase I Report and Summary which includes, at a minimum:

a. The information identified below regarding the required soil sampling/analysis effort at each SWMU where such an investigation is necessary.

b. The information identified below regarding any subsurface investigation at each SWMU of concern;

c. Information which the workplan indicates will be in the report except as modified by this letter.

d. A chronological summary of Phase I activities and the cost involved.

e. Color photo documentation of Phase I activities.

f. A description of the qualifications of personnel performing and directing the RFI activities including contractor personnel.

g. A general discussion of the activities which should be carried out as part of Phase 2 of the RCRA Facility Investigation.

The original and two (2) copies of all certifications, logs, or reports which are required to be submitted to the Agency by the facility should be mailed to the following address:

Illinois Environmental Protection Agency
Division of Land Pollution Control -- #33
Permit Section
2200 Churchill Road
Post Office Box 19276
Springfield, Illinois 62794-9276

3. If the Agency determines that implementation of this RFI Workplan fails to satisfy the requirements of Section IV of the RCRA Part B Permit (Log No. B-96), the Agency reserves the right to require that additional work be completed to satisfy these requirements. Revisions of RFI Workplans are subject to the appeal provisions of Section 40 of the Illinois Environmental Protection Act.

4. All soil samples shall be analyzed individually (i.e., no compositing). Analytical procedures shall be conducted in accordance with Test Methods for Evaluating Solid Wastes, Third Edition (SW-846). When a SW-846 (Third Edition) analytical method is specified, all the chemicals listed in the Quantification Limits Table for that method shall be reported unless specifically exempted in writing by the Agency. Apparent visually contaminated material within a sampling interval shall be included in the sample portion of the interval to be analyzed. To demonstrate a parameter is not present in a sample, analysis results must show a detection limit at least as low as the PQL for that parameter in the third edition of SW-846.

5. The following procedure must be utilized in the collection of all required soil samples:

   a. The procedures used to collect the soil samples must be sufficient so that all soil encountered is classified in accordance with ASTM Method D-2488.

   b. If a drill rig or similar piece of equipment is necessary to collect required soil samples, then:

      1. The procedures specified in ASTM Method D-1586 (Split Spoon Sampling) or D-1587 (Shelby Tube Sampling) must be used in collecting the samples.

      2. Soil samples must be collected continuously at several locations to provide information regarding the shallow geology of the area where the investigation is being conducted;

c. Soil samples not collected explicitly for VOC analysis should be field-screened for the presence of VOCs at all locations where VOCs are a concern;

d. When visually discolored or contaminated material exists within an area to be sampled, horizontal placement of sampling locations shall be adjusted to include such visually discolored and/or contaminated areas. Sample size per interval shall be minimized to prevent dilution of any contamination.

6. Quality assurance/quality control procedures which meet the requirements of SW-846 must be implemented during all required sampling/analysis efforts. In addition, sample collection, handling, preservation, preparation and analysis must be conducted in accordance with the procedures set forth in SW-846 and the requirements set forth in this letter.

7. The proposed decontamination methods for the sampling equipment is hereby approved. All wash/rinse waster resulting from decontamination activities shall be collected. If analysis of the rinse water detect the presence of hazardous constituents or it exhibits a characteristic of hazardous waste, then the wash or rinse water shall be collected and managed as a hazardous waste. In any event the material must be managed as a special waste.

8. The soil sampling locations proposed by Safety-Kleen Corp. in Figure IV-1-3 and the methodology proposed for field screening samples for determining which samples should be analyzed by the laboratory for SWMU #13, SWMU #14, and SWMU #16 are hereby approved for an initial soil sampling effort to provide a preliminary indication if soils are contaminated. All other soil samples to be analyzed by the laboratory must be collected in accordance with the procedures set forth in SW-846 and must achieve detection limits at least as low as PQLS for that parameter in the third edition of SW-846.

a. To demonstrate conclusively that there has been no release from SWMU #13, SWMU #14, and SWMU #16 the procedures in Condition 9, 10, and 11 must be followed. The sampling effort described in Conditions 9 through 11 may be conducted as part of the Phase I investigation, or may be conducted as part of the Phase II activities.

b. Should the initial sampling effort indicate that there has been a release to the soil, then additional samples must be collected to further characterize the vertical and horizontal extent of soil contamination. For such a sampling/analysis effort: (a) additional samples may be collected in accordance with this letter for this characterization; or (b) a sampling plan may be developed for approval and execution as part of the Phase II investigation.

9. To demonstrate conclusively that there has been no release from SWMU #13 and that no further investigation/corrective action is necessary for that SWMU, soil samples should be:

a. collected at locations shown in Figure IV-1-3 of the subject submittal.

b. collected from vertical intervals of 0-6" and 18-24" beneath the trench subgrade/natural soil interface;

c. analyzed for total volatile organic compounds (VOCs) by Method 8240 of SW-846.

d. analyzed for total semi-volatile organic compounds (SVOCs) by Method 8270 of SW-846.

e. analyzed using the TCLP test for the metals listed below.

The detection limit achieved during these analyses should be equal to or below the following values:

Metal	Detection Limit to be Achieved (mg/l)
Arsenic	0.05
Barium	2.0
Cadmium	0.005
Chromium	0.1
Lead	0.0075
Mercury	0.0002
Selenium	0.005
Silver	0.05

f. analyzed for mineral spirits by a SW-846 method that will achieve the detection limit of 50 mg/kg; and

g. collected in accordance with the procedures of this letter.

10. To demonstrate conclusively that there has been no release from SWMU #14 and that no further investigation/corrective action is necessary for that SWMU, soil samples should be:

a. collected at locations shown in Figure IV-1-3 of the subject submittal;

b. collected from vertical intervals of 6-12" and 24-30" beneath the backfill/natural soil interface at the bottom of the sump;

c. analyzed in accordance with the procedures of Condition 9 items c through f; and

d. collected in accordance with the procedures of this letter.

11. To demonstrate conclusively that there has been no release from SWMU #16, soil samples should be:

a. collected from an additional two (2) locations to the two (2) locations proposed in Figure IV-1-4 of the subject submittal (A total of four locations). One of these additional locations should be located approximately 15′ east of the midpoint located between the two proposed sample locations in figure IV-1-4 of the subject submittal. The other additional location should be located approximately 15' west of the midpoint located between the two proposed sample locations in Figure IV-1-4 of the subject submittal;

b. collected from vertical intervals that are deeper than the former excavation depth. (ie. 30-36" and 48-54" beneath the soil surface);

12. If the Agency's DLPC determines, based on the data obtained from the Phase I Workplan activities, that there has been no release of hazardous waste or hazardous constituents to the environment from a SWMU identified in Condition 1 above, then no further investigative action will be required for that SWMU. If the Agency's DLPC determines, based on the data, that there has been a release of hazardous waste or hazardous constituents to the environment or that the data is inconclusive, the Permittee will be notified by the Agency's DLPC.

13. The Health and Safety Plan contained in the subject workplan is neither approved nor disapproved. Under the provisions of 29 CFR 1910 (51 FR 15,654, December 19, 1986), cleanup operations must meet the applicable requirements of OSHA's Hazardous Waste Operations and Emergency Response standard. These requirements include hazard communication, medical surveillance, health and safety programs, air monitoring, decontamination and training. General site workers engaged in activities that expose or potentially expose them to hazardous substances must receive a minimum of 40 hours of safety and health training off site plus a minimum of three days of actual field experience under the direct supervision of a trained experienced supervisor. Managers and supervisors at the cleanup site must have at least an additional eight hours of specialized training on managing hazardous waste operations.

14. Reports must be prepared and submitted to the Agency which describe the activities completed each quarter of the calendar year while the Phase I investigation is being carried out. The quarterly reports shall contain at a minimum:

    a. An estimate of the percentage of the investigation completed;

    b. Summary of activities completed during the reporting period;

    c. Summaries of all actual or proposed changes to the Workplan or its implementation;

    d. Summaries of all actual or potential problems encountered during the reporting period;

    e. Proposal for correcting any problems;

    f. Projected work for the next reporting period; and

    g. Other information or data as requested in writing by the Agency's DLPC.

15. A quarterly report for the work completed from the date of this letter to September 30, 1994 must be submitted to the Agency by October 31, 1994. Subsequent quarterly reports must be submitted in a similar manner until the final Phase I RFI Report is submitted to the Agency. Compliance with these dates constitutes compliance with the dates specified in Section V of the Part B Permit issued to the facility.

16. The portion of the final RFI Phase I report documenting the results of the required soil sampling/analysis effort must contain the following information, for each SWMU investigated:

    a. A discussion of (1) the reason for the sampling/analysis effort conducted at each SWMU and (2) the goals of the sampling analysis effort conducted at each SWMU;

    b. A scaled drawing showing the horizontal and vertical location where all soil samples were collected at each SWMU;

    c. Scaled drawings that show the levels of each constituent that is detected for each sample. These drawings should be easily cross-referenced with the drawing referred to in Condition 16 item b.

    d. Scaled drawings that show levels of the results of field screening. These drawings should be easily cross-referenced with the drawing referred to in Condition 16 item b.

    e. Justification for the locations from which soil samples were collected;

    f. A description of the procedures used for:

        1. Sample collection;

        2. Sample preservation;

        3. Chain of custody; and

        4. Decontamination of sampling equipment.

    g. Visual classification of each soil sample collected for analysis;

    h. A discussion of the results of any field screening efforts;

    i. A description of the soil types encountered during the investigation, including scaled cross-sections;

    j. A description of the procedures used to analyze the soil samples, including:

        1. The analytical procedure used, including the procedures, if any, used to prepare the sample for analysis;

2. Any dilutions made to the original sample;

3. Any interferences encountered during the analysis of each sample; and

4. The practical quantification limit achieved, including justification for reporting PQLs which are above those set forth in SW-846.

k. A description of all quality control/quality assurance analyses conducted, including the analysis of lab blanks, trip blanks and field blanks;

l. A description of all quality assurance/quality control efforts made overall;

m. A summary of all analytical data, including QA/QC results, in tabular form;

n. Copies of the final laboratory sheets which report the results of the analyses, including final sheets reporting quality assurance/quality control data;

o. Colored photographs documenting the sampling effort; and

p. A discussion of the collected data. This discussion should identify those sample locations where contaminants were detected and the concentrations of the contaminants. Conclusions which can be drawn from the information compiled should also be included in this discussion.

17. All references to the "Agency's RCRA closure plan instructions" refer to the document entitled Instructions for the Preparation of Closure Plans for Interim Status RCRA Hazardous Waste Facilities, . A copy of this document is enclosed.

18. All soil samples which will be analyzed for volatile organic compounds at the laboratory must be collected in accordance with Attachment 7 of the Agency's RCRA closure plan instructions. Teflon may however be substituted for aluminum foil to seal the ends of the tubes. If the type of soil being collected cannot be obtained using a tube sampling device, then the sampling procedures shall be such that (1) agitation/aeration of the sample is minimized and (2) no head space is allowed to remain in the container used to transport the soil to the laboratory.

19. It must be noted that use of PID readings, total testing for inorganics, and the TCLP test for volatile organic compounds in establishing cleanup objectives in soil may not be acceptable, as no information has yet been provided demonstrating that this procedure would meet the aforementioned closure performance standards.

20. The Agency and representative of Safety-Kleen Corporation have agreed that background soil samples should not be collected until after the horizontal and vertical extent of soil contamination has been determined.

21. Any report submitted to the Agency by Safety-Kleen proposing cleanup objectives based upon background concentrations must include the following information regarding the background sampling/analysis effort (such a report shall be submitted to the Agency after the vertical and horizontal extent of the soil contamination has been determined:

    a. A scaled drawing showing each background soil sample location. Samples must be collected from areas unaffected by the operations of the facility;

    b. The depth from which the samples will be collected;

    c. The procedures which will be used to collect the samples;

    d. The parameters which will be analyzed for;

    e. The analytical methods to be used;

    f. The statistical Methods to be used in evaluating the data. An acceptable method can be found in Chapter 9 Table 9-1, Equation 6 of <u>Test Methods for Evaluating Solid Waste</u>. Third Edition (SW-846).

Should you have any questions regarding this matter, please contact Gregg Sanders at 217/524-3308.

Sincerely,

Douglas W. Clay

Douglas W. Clay, P.E.
Hazardous Waste Branch Manager
Permit Section, Bureau of Land

DWC:GS:sad/0338W,1-9sp
JKM

Attachments: RFI Phase I Certification
RFI Phase I Laboratory Certification Statement
RCRA Closure Plan Instructions

cc: USEPA Region V -- George Hamper

B-89

USEPA

PROJECT: 823

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MAY 04 1994

RCRA FACILITY INVESTIGATION
PHASE I RELEASE ASSESSMENT WORKPLAN
PEKIN, ILLINOIS SERVICE CENTER

March 3, 1994

Submitted by:

Safety-Kleen Corp.
1000 N. Randall Road
Elgin, IL 60123

TriHydro Corporation

920 Sheridan Street
Laramie, Wyoming 82070

(307) 745-7474
FAX: (307) 745-7729

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PART IV - SAMPLING AND ANALYSIS PLAN

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PART I

PROJECT: 823

PART I

GENERAL FACILITY INFORMATION

RCRA FACILITY INVESTIGATION
PHASE I RELEASE ASSESSMENT WORKPLAN
PEKIN, ILLINOIS SERVICE CENTER

March 3, 1994

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CHAPTER I-1

INTRODUCTION

Safety-Kleen Corp. (S-K) owns and operates a service center in Pekin, Illinois. The Pekin Service Center is used to collect and temporarily store spent mineral spirits, immersion cleaner, dry cleaner solvent, paint wastes and waste oil, until the materials are shipped to a S-K recycle center for reclamation into products and fuels.

The Pekin Service Center is permitted for final status to store temporarily RCRA hazardous wastes (ILD 093862811). As a condition of the RCRA permit, the Illinois Environmental Protection Agency (IEPA) requires S-K to conduct a RCRA Facility Investigation (RFI). The purpose of the RFI is to determine the nature and extent of releases of hazardous wastes and hazardous constituents from certain solid waste management units (SWMUs) and areas of concern (AOC) at the facility.

In accordance with the RCRA permit, the RFI is divided into three phases. This RFI Phase I Workplan describes the procedures that will be undertaken to determine if the subject SWMUs have released hazardous wastes and/or hazardous constituents to the soil or air. The Workplan has been organized per Attachment E of the RCRA Permit, entitled "Scope of Work for a RCRA Facility Investigation."

CHAPTER I-2

FACILITY OPERATIONS

Pekin Service Center

The Pekin Service Center is one of 170 Safety-Kleen Corp. (S-K) service centers that operate as collection sites for large centrally located recycle centers where the collected wastes are reclaimed into useful products and fuels. Six types of waste collection services are offered by the Pekin Service Center. These services are distinguished by the type and source of waste collected, as follows:

- Parts Cleaner Service
- Dry Cleaner Service
- Paint Waste Collection
- Spent Antifreeze Collection
- Waste Oil Collection
- Fluid Recovery Service (FRS)

The parts cleaner wastes, dry cleaning wastes, paint waste and spent antifreeze are Resource Conservation and Recovery Act (RCRA) regulated hazardous wastes that are accumulated and stored at the Pekin Service Center. Tanks and container storage areas for these wastes are identified in the Part B Permit. Waste oils are nonhazardous wastes collected from various generators, accumulated at a Safety-Kleen service center, and shipped to a S-K recycle center for refining or blending as a waste fuel. FRS wastes are managed in outdoor enclosed metal shelters on a 10-day transfer basis in accordance with 40 CFR 263.12. These wastes are transported from the service center to a Safety-Kleen recycle center or to an independent reclaimer.

Location

The Pekin facility occupies approximately 1 acre, and is located two miles south of Pekin in a rural area. A facility location map can be referenced as Figure I-2-1. The facility is bordered to the north and east by open land and to the south by a concrete company. The land immediately to the west

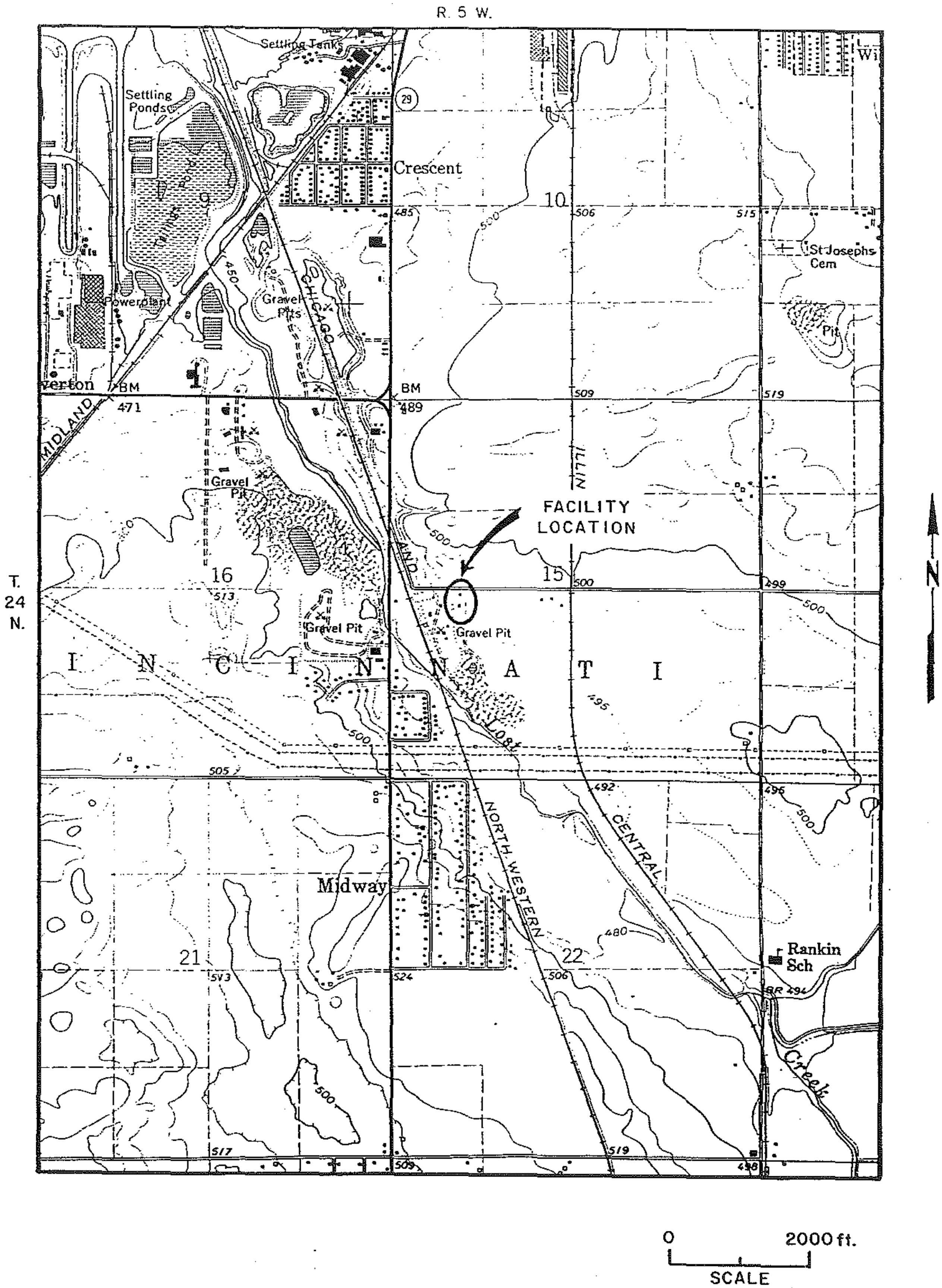


FIGURE I-2-1 : FACILITY LOCATION MAP, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

of the service center and the property upon which the service center is located are owned by S-K.

The Pekin Service Center has been operating as a hazardous waste storage facility since April 1, 1976. A site map is presented as Figure I-2-2. The solid waste management units (SWMUs) under investigation are all located on the east side of the facility. It consists of the following structures:

a. A 2,000-square foot office building.

b. A 2,250-square foot warehouse with a 427.5-square foot container storage area.

c. A tank farm containing four 20,000-gallon aboveground storage tanks for clean and spent mineral spirits and nonhazardous waste oil.

d. One 10,000-gallon aboveground storage tank for spent antifreeze.

e. A mineral spirits return and fill station with a loading dock.

f. A flammable waste storage shelter for temporary storage of paint wastes.

g. Two FRS waste transfer shelters.

h. A trailer truck for storage of FRS wastes.

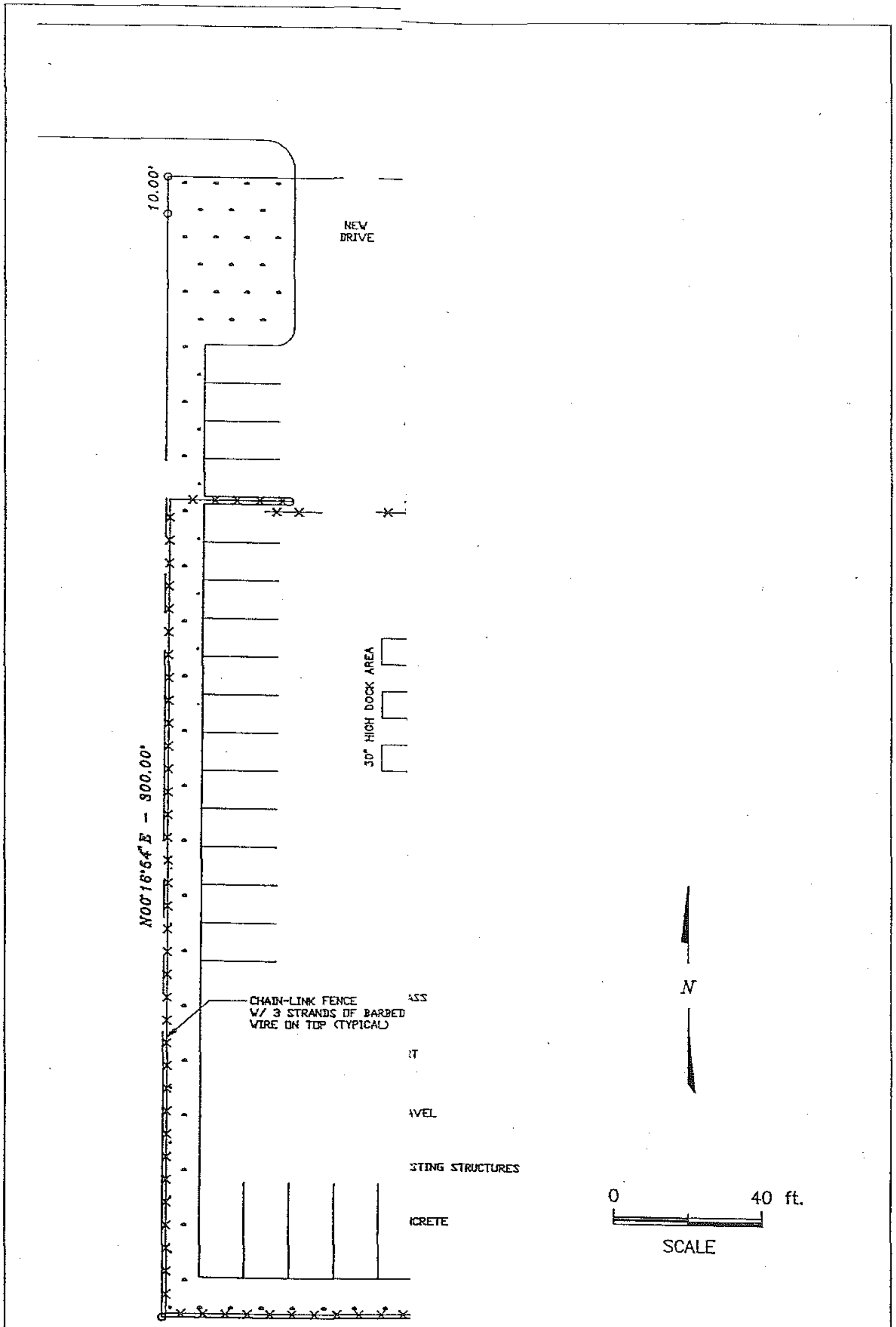
i. A storage room.

j. Two additional office areas.

Present Operations

The Pekin Service Center generates six general types of waste from servicing Safety-Kleen customers:

- Spent mineral spirits wastes
- Immersion cleaner waste
- Dry cleaner waste
- Paint wastes
- Spent antifreeze



I-2-2 :SITE MAP, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

SKPI1117

- Waste oil

Releases in the warehouse, tank farm, return and fill station, waste storage shelter, and waste transfer shelter (if any) are covered under corrective action provisions of the Part B Permit, other than those pertaining to this RCRA Facility Investigation (RFI) Workplan. The information on present operations is included in the Workplan in response to guidance in Attachment E of the Part B Permit.

Spent Mineral Spirits Wastes

Spent mineral spirits is the principal waste managed at the service center. Spent mineral spirits from parts washers is accumulated in 20,000-gallon aboveground storage tanks via the return and fill station. Sixteen- and 30-gallon drums containing 7 and 12 gallons of solvent, respectively, are poured into a dumpster at the return and fill station. The contents of the dumpster are pumped into the storage tank. Spent mineral spirits waste is a RCRA ignitable and toxic waste. Three types of mineral spirits waste results from the waste handling method described above:

- Spent mineral spirits
- Bottom sediment in the tank
- Dumpster sediment

A S-K vacuum truck removes tank and dumpster sediment for reclamation. The typical chemical composition of the spent mineral spirits sent to the recycle center and of recycled mineral spirits shipped back to the Pekin Service Center (for subsequent shipment to customers) is shown in Appendix I-A, and an MSDS for mineral spirits is presented in Appendix V-B of the Health and Safety Plan.

Immersion Cleaner Waste

S-K stores containerized immersion cleaner in the warehouse. The material contains a nonhalogenated hydrocarbon mixture of petroleum naphtha, N-methyl-2-pyrolidone, dipropylene glycol methyl ether monoethanolamine, and oleic acid. This waste is RCRA toxic, and old formula immersion cleaner is RCRA ignitable and RCRA toxic. A small quantity of the old formula immersion cleaner is accepted at the facility. The old formula contains ortho-dichlorobenzene, methylene chloride, and cresylic acid. This formula is characterized as ignitable and handled and stored appropriately. A typical composition of the immersion cleaner waste is shown in

Appendix I-A, and an MSDS for immersion cleaner is presented in Appendix V-B of Health and Safety Plan.

Dry Cleaning Wastes

S-K stores containerized dry cleaning wastes in the warehouse. Dry cleaning wastes consist of spent filter cartridges, powder residue from diatomaceous or other powder filter systems, and still bottoms. Approximately 80 percent of the dry cleaning solvent used is perchloroethylene, about 17 percent is mineral spirits, and the remaining 3 percent is 1,1,2-trichloro-1,2,2-trifluoroethane. Dry cleaning wastes are RCRA ignitable and toxic. A sample analysis for the various dry cleaning wastes is included in Appendix I-A, and an MSDS for constituents associated with dry cleaning solvent is presented in Appendix V-B of the Health and Safety Plan.

Paint Wastes

S-K stores paint wastes in the flammable waste storage shelter before transfer to recycle centers. Paint wastes consist of various lacquer thinners and paints. The lacquer thinners contain nonhalogenated solvents (toluene, xylene, methyl ethyl ketone, methyl butyl ketone) and the paints contain cadmium, chromium, and lead. Paint wastes are RCRA toxic. Appendix I-A contains laboratory analyses of representative paint wastes. An MSDS for the lacquer thinner product is presented in Appendix V-B of the Health and Safety Plan.

Spent Antifreeze

Spent antifreeze is about one third water and two thirds antifreeze (ethylene glycol). The tanker trucks empty the waste into a 10,000-gallon aboveground storage tank at the Pekin Service Center. Spent antifreeze at the service center is periodically pumped into a 7,500-gallon tanker truck for transport to a recycle center. In the event tank storage is not available, the waste is pumped into 55-gallon drums. The drummed waste is placed in the warehouse container storage area before transport to a recycle facility. Appendix I-A contains laboratory analyses of a representative spent antifreeze sample. An MSDS for antifreeze is presented in Appendix V-B of the Health and Safety Plan.

Waste Oil

Waste oils are nonhazardous wastes collected from a wide variety of generators, accumulated in a tank at the Pekin Service Center, and shipped to a permitted facility for

refining or blending as a waste fuel. Appendix V-B of the Health and Safety Plan contains an MSDS for waste oil.

Previous Operations

The Pekin Service Center was previously owned by Shallonburger Excavating. Shallonburger Excavating used the facility as a home base to garage four to five trucks.

Spills or Releases

A Spill History for the Pekin Service Center is included as Appendix I-B. A waste oil/water mixture spill that occurred in February of 1989 is an area of concern (AOC) to be investigated during the Phase I RFI. Evidence of stressed vegetation which can indicate an occurrence of contamination is not evident at the Pekin Service Center. No reports of accidents involving tanker trucks driven by the Pekin Service Center personnel have taken place. No governmental actions regarding a release nor any citizen complaints indicating a possible release have been recorded. Spill prevention procedures ensure that any minor spills are detected and cleaned up in an efficient manner protective of human health and environment.

CHAPTER I-3

SOLID WASTE MANAGEMENT UNITS

The Part B Permit for the Pekin Service Center lists three solid waste management units (SWMUs) or areas of concern (AOCs) to be addressed during the Phase I Release Assessment:

- SWMU #13 - Warehouse Area Trench
- SWMU #14 - Warehouse Drain
- AOC #16 - Past Oil Spill Area

Locations of the two SWMUs and the AOC are shown on Figure I-3-1. The SWMUs and AOC are described below.

SWMU #13 - Warehouse Area Trench

The warehouse was used by Shallonburger Excavating, who used the warehouse as a home base to garage four to five work trucks. The warehouse is currently used by S-K to store containerized waste, including dry cleaning solvents, immersion cleaner waste, spent antifreeze, and dumpster sediment. The warehouse area has a secondary containment trench with dimensions 22 feet long, 3 feet wide, and 3.8 feet deep. The trench is located inside the warehouse near the south end. The secondary containment trench has a capacity of 1,860 gallons. The trench is constructed of cinder blocks and is covered by a removable metal grate.

An assessment of the Container Storage Area, which contains the secondary containment trench, was conducted by Harding Lawson Associates in December 1991. This assessment indicated that the trench had small cracks in two locations. To correct this condition, the inside of the cinder blocks were pressure grouted to seal the trench, and the trench was coated with a trichloroethylene/perchloroethylene resistant polymer coating. A subsequent assessment of the Container Storage Area, including the secondary containment trench, was conducted by Harding Lawson Associates in September 1992. This assessment determined that the Container Storage Area was structurally intact, and met applicable requirements of Illinois Administrative Code for containerized waste storage. No releases have occurred to the warehouse area trench according to S-K records (Appendix I-B).

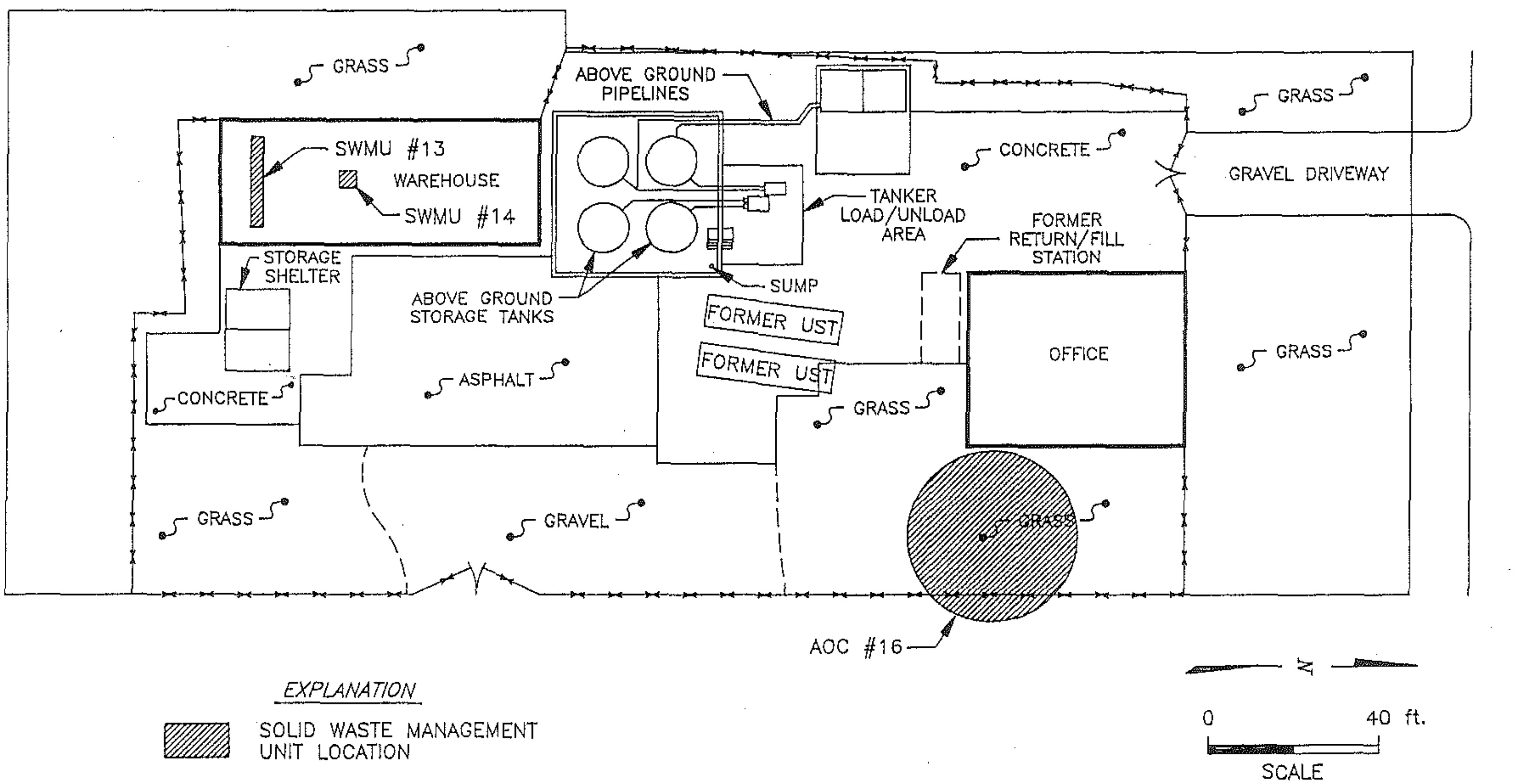


FIGURE I-3-1 :LOCATION MAP, SOLID WASTE MANAGEMENT UNITS (PHASE I), SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

SKPISMU2

SWMU #14 - Warehouse Drain

The warehouse drain was located in the warehouse, north of the trench. The drain was 4 feet 2 inches square, had a concrete floor, and a sump pump in the bottom to evacuate any fluid accumulation. Per Roger Brotherton, the Pekin Service Center Branch Manager, the drain had block walls, a chemical resistant coating, and was plugged and capped off with concrete two to three years ago. No releases have occurred to the warehouse drain, according to S-K records (Appendix I-B).

AOC #16 - Past Oil Spill Area

On February 21, 1989, a spill of approximately 1,000 gallons of a waste oil/water mixture occurred from a truck tanker. This spill covered an area approximately 40 feet by 40 feet, and was located approximately 50 feet east of the former underground storage tanks outside the fence and along the fenceline.

Available information indicates that the spill occurred onto soil. Peoria Disposal Company (PDC) backhoed 129 cubic yards of visually stained soil and disposed of the soil at the Clinton Landfill. Analysis of soil excavated from this release area revealed a total lead concentration of 34 mg/Kg, which is in the range of typical urban background concentrations. The EP TOX lead concentration was 0.15 mg/L, which is well below the hazardous waste toxicity standard of 5.0 mg/L.

CHAPTER I-4

REGIONAL SETTING

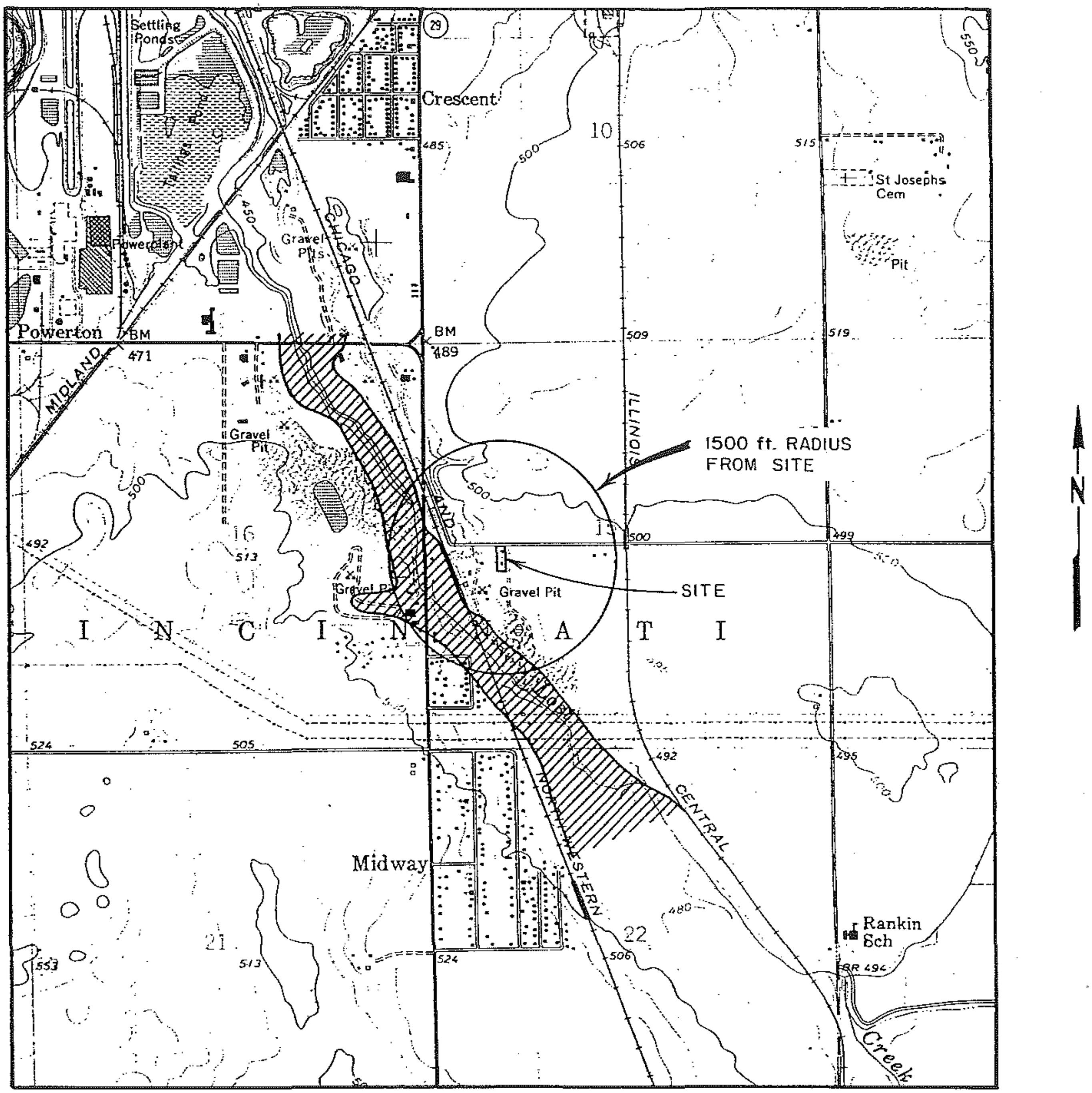
A topographic map featuring the Pekin Service Center and surrounding areas is shown as Plate 1. The Pekin Service Center is located on a terrace above the Lost Creek Floodplain. The Pekin facility is approximately 25 feet higher in elevation than Lost Creek. Elevation increases north and east of the facility. Because it is on the terrace, the Pekin Service Center is outside the 100-year floodplain (Figure I-4-1).

Land Use

The Pekin Service Center is located in Tazewell County, Illinois, on Rural Route #3 or VFW Road, which turns east from Route 29 about 1/3 mile south of Powerton Road. This area is zoned for industrial use. To the best of Safety-Kleen's knowledge, no easements or title, deed, or usage restrictions exist that may be in conflict with operations at this facility. The Pekin facility is bordered to the north and east by open land, and to the south by a concrete company. The service center property and the property immediately to the west of the service center is owned by Safety-Kleen.

Ground-Water Use

Tazewell County is a largely rural area; the main farm crops are corn and soybean. A map of all wells within two miles of the Pekin facility can be referenced as Figure I-4-2. A listing of wells is provided in Appendix I-C. There are no wells at the Pekin Service Center. The service center uses a private well located on the property of the adjacent concrete company, immediately south of the service center, for potable water. Fewer than five homes lie within 1/4 mile of the facility; these homes use private wells. These private wells are completed at depths between 70 and 120 feet. No schools or municipalities with private wells lie within 1/4 mile of the facility. Pekin is served by seven municipal wells developed in alluvial sand and gravel with depths ranging from 89 to 154 feet. Most wells are located in the Lost Creek or Illinois River alluvium, rather than on the terrace. The nearest of these wells is approximately 2 miles north of the facility.

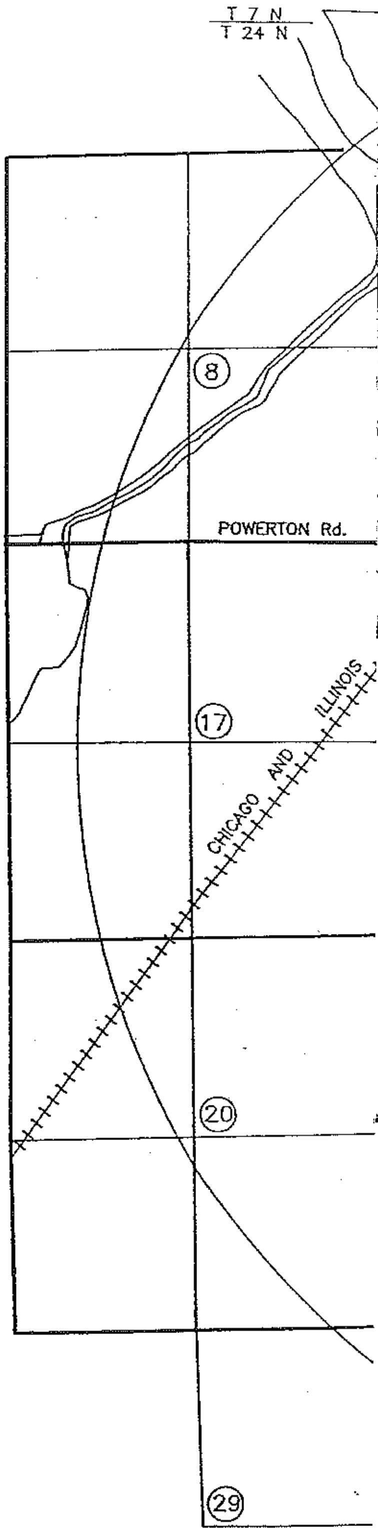


EXPLANATION

100 YEAR FLOOD BOUNDARY

0 2000 ft.
SCALE

FIGURE I-4-1 :FLOODPLAIN MAP, SAFETY--KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS



EXPLANATION

: WATER SUPPLY WELL WITH
SPONDING PICS DATABASE
ENCE NUMBER.

RCIAL/INDUSTRIAL WATER SUPPLY
WITH CORRESPONDING PICS/PRIVATE
DATABASE REFERENCE NUMBER.

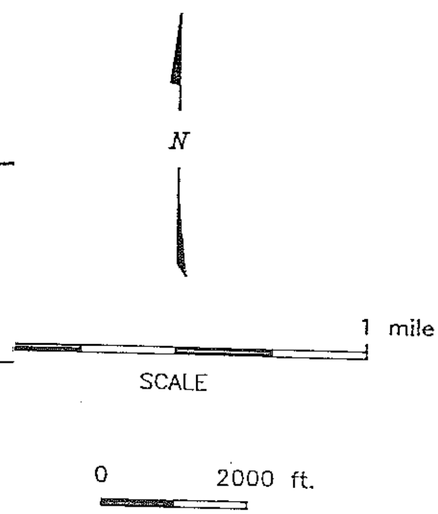
E WATER SUPPLY WELL WITH
SPONDING PRIVATE WELL DATABASE
ENCE NUMBER.

E (QUARTER-QUARTER-QUARTER
N) LOCATION NOT AVAILABLE

THAN ONE COMMERCIAL/INDUSTRIAL
REPRESENTED

THAN ONE PRIVATE WELL REPRESENTED

N NUMBER



:WELLS LOCATED WITHIN 1 AND 2
MILES OF SAFETY-KLEEN CORP.
SERVICE CENTER, PEKIN, ILLINOIS

SKPWLMI

Significant Surface Feature

The general surface drainage pattern at the facility is to the southwest. Rain water collects in a low spot near the tank loading area, or runs off the concrete pavement. The pavement is sloped, carrying water down and away from the warehouse and parking lot. The water runs off the concrete area and into a shallow soil trough, which runs parallel to the east side of the warehouse. The nearest surface waters are the Illinois River, Lost Creek, and a small pond, located approximately 1.5, 0.25, and 0.25 miles away, respectively. Runoff from the service center does not flow overland to a surface water body.

CHAPTER I-5

REFERENCES

Illinois Environmental Protection Agency, 1989, CERCLA Environmental Priorities Initiative Preliminary Assessment Report.

Safety-Kleen Corp., 1993, RCRA Part B Permit Application, Pekin Service Center, Revision 4, January 15, 1993.

APPENDIX I-A

TYPICAL COMPOSITION OF WASTES MANAGED AT THE PEKIN SERVICE CENTER

Parts Washer Solvent Wastes

Physical Properties and TCLP Analysis, ppm

Parameter	*Reg. Limit*	*# Samp*	*Avg*	*Min*	*Max*
pH	<2 or >10	7	6.6	5.5	8.0
SG	na	7	0.79	0.78	0.80
FP	< 100	7	112	78	151
As	5	7	0.00	0.00	0.00
Ba	100	7	0.47	0.00	1.20
Cd	1	7	0.05	0.00	0.07
Cr	5	7	0.00	0.00	0.02
Pb	5	7	0.90	0.47	1.60
Hg	0.2	7	0.00	0.00	0.00
Se	1	7	0.00	0.00	0.00
Ag	5	7	0.00	0.00	0.00
cresol	200	7	2.70	0.00	9.00
2.4-DNT	0.13	7	0.63	0.00	4.40
Cl6-benz	0.13	7	0.00	0.00	0.00
Cl6-13-but	0.5	7	0.00	0.00	0.00
Cl6-eth	3	7	0.00	0.00	0.00
nitrobenz	2	7	0.00	0.00	0.00
Cl5-phenol	100	7	0.00	0.00	0.00
pyridine	5	7	0.00	0.00	0.00
2.4.5-TCP	400	7	0.00	0.00	0.00
2.4.6-TCP	2	7	0.00	0.00	0.00
benzene	0.5	7	0.04	0.00	0.15
CCl4	0.5	7	0.00	0.00	0.00
Clbenz	100	7	0.00	0.00	0.00
CHCl3	6	7	0.06	0.00	0.41
1.4-DClB	7.5	7	0.05	0.00	0.38
1.2-DCA	0.5	7	0.00	0.00	0.00
1.1-DCE	0.7	7	0.00	0.00	0.00
MEK	200	7	0.74	0.00	3.90
PCE	0.7	7	0.65	0.00	2.80
TCE	0.5	7	0.07	0.00	0.49
VChloride	0.2	7	0.00	0.00	0.00

Less than values are treated as zeros in the statistical analysis
Greater than values are treated as the value in the statistical analysis

Parts Washer Solvent Wastes
TCLP Organics And EPA 8240/8270 Analyses, ppm

		Parameter	cresol	2.4-DNT	Cl6-benz	Cl6-13-but	Cl6-eth	nitrobenz	Cl5-phenol	pyridine	2.4.5-TCP	2.4.6-TCP
		Reg. Limit	200	0.13	0.13	0 5	3	2	100	5	400	2
LAB	*SITE*	*ANALYSIS*								na		
M	*CL*	*TCLP*	[illegible]	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0 17	< 0.17	< 0.033	< 0 033
M	*CL*	*8240/8270*	< 1	< 1	< 1	< 1	< 1	< 1	< 5	na	< 1	< 1
W	*DE*	*TCLP*	3	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0 17	< 0.17	< 0.033	< 0 033
W	*DE*	*8240/8270*	280	< 100	< 100	< 100	< 100	< 100	< 500	na	< 100	< 100
W	*EL*	*TCLP*	6.7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 1.0	< 1.0
W	*EL*	*8240/8270*	< 1200	< 1200	< 1200	< 1200	< 1200	< 1200	< 6200	na	< 1200	< 1200
W	*HE*	*TCLP*	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 1 6	< 1.6	< 0 33	< 0.33
W	*HE*	*8240/8270*	< 1200	< 1200	< 1200	< 1200	< 1200	< 1200	< 6200	na	< 1200	< 1200
M	*LE*	*TCLP*	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0 17	< 0.17	< 0.033	< 0.033
M	*LE*	*8240/8270*	< 50	< 50	< 50	< 50	< 50	< 50	< 250	na	< 50	< 50
M	*MA*	*TCLP*	< 0 67	4.4	< 0.67	< 0 67	< 0 67	< 0.67	< 3 3	< 3.3	< 0.67	< 0 67
M	*MA*	*8240/8270*	< 100	< 100	< 100	< 100	< 100	< 100	< 500	na	< 100	< 100
C	*RE*	*TCLP*	0.21	< 0.033	< 0.033	< 0 033	< 0 033	< 0 033	< 0 17	< 0 17	< 0.033	< 0 033
C	*RE*	*8240/8270*	< 100	< 100	< 100	< 100	< 100	< 100	< 500	na	< 100	< 100

		Parameter	benzene	CCl4	Clbenz	CHCl3	1.4-DClB	1.2-DCA	1 1-DCE	MEK	PCE	TCE	VChloride
		Reg. Limit	0.5	0.5	100	6	7.5	0 5	0 7	200	0.7	0 5	0 2
LAB	*SITE*	*ANALYSIS*											
M	*CL*	*TCLP*	[illegible]	< 0.10	< 0.10	< 0.10	< 0 20	< 0.10	< 0.10	< 2.0	0.61	< 0.10	< 0 20
M	*CL*	*8240/8270*	< 50	< 50	< 50	< 50	< 100	< 50	< 50	< 1000	96	410	< 100
W	*DE*	*TCLP*	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0 10	< 2.0	0.16	< 0.10	< 0 20
W	*DE*	*8240/8270*	< 60	< 60	< 60	< 60	< 60	< 60	< 60	< 1200	720	< 60	< 120
W	*EL*	*TCLP*	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	3.9	2.8	< 0 10	< 0 20
W	*EL*	*8240/8270*	< 62	< 62	< 62	< 62	< 62	< 62	< 62	< 1200	930	< 62	< 120
W	*HE*	*TCLP*	< 0.10	< 0.10	< 0.10	< 0 10	< 0.10	< 0.10	< 0.10	< 2 0	< 0.10	0 49	< 0 20
W	*HE*	*8240/8270*	< 62	< 62	< 62	< 62	90	< 62	< 62	< 1200	1900	< 62	< 120
M	*LE*	*TCLP*	< 0.10	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	< 0.10	< 2 0	0.58	< 0.10	< 0 20
M	*LE*	*8240/8270*	< 50	< 50	< 50	< 50	< 100	< 50	< 50	< 1000	140	61	< 100
M	*MA*	*TCLP*	0.15	< 0.10	< 0.10	0.41	< 0.20	< 0.10	< 0.10	< 2.0	0.15	< 0 10	< 0 20
M	*MA*	*8240/8270*	< 120	< 120	< 120	< 120	< 250	< 120	< 120	< 2500	< 120	< 120	< 250
C	*RE*	*TCLP*	0.12	< 0 05	< 0 05	< 0 05	0.38	< 0.05	< 0 05	1.3	0 27	< 0 05	< 0 1
C	*RE*	*8240/8270*	< 300	< 300	< 300	< 300	1500	< 300	< 300	< 6000	1500	< 300	< 600

Parts Washer Solvent Wastes

Physical Properties and TCLP Metals Analysis, ppm

LAB	SITE	pH	SG	FP	As	Ba	Cd	Cr	Pb	Hg	Se	Ag
	Reg. Limit	<2 or >10	na	< 100	5	100	1	5	5	0.2	1	5
M	*CL*	6.5	0.79	125	< 0.5	0.51	0.041	< 0.01	0.47	< 0.001	< 0.2	< 0.01
W	*DE*	6.5	0.799	110	< 0.05	0.6	< 0.05	< 0.05	1.3	< 0.01	< 0.05	< 0.05
W	*EL*	7	0.777	151	< 0.05	0.6	0.06	< 0.05	0.5	< 0.01	< 0.05	< 0.05
W	*HE*	6.5	0.775	95	< 0.05	1.2	0.07	< 0.05	1.2	< 0.01	< 0.05	< 0.05
M	*LE*	6	0.78	115	< 0.5	0.27	0.055	< 0.01	0.74	0.002	< 0.2	< 0.01
M	*MA*	6.5	0.8	110	< 0.5	< 1.0	0.059	0.017	1.6	0.0018	< 0.2	< 0.01
C	*RE*	8	0.79	78	< 1	0.09	0.05	< 0.02	0.5	< 0.002	< 1	< 0.05

TCLP Semi Volatiles Analysis, ppm

LAB	SITE	cresol	2.4-DNT	Cl6-benz	Cl6-13-but	Cl6-eth	nitrobenz	Cl5-phenol	pyridine	2.4.5-TCP	2.4.6-TCP
	Reg. Limit	200	0.13	0.13	0.5	3	2	100	5	400	2
M	*CL*	9	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.17	< 0.17	< 0.033	< 0.033
W	*DE*	3	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.17	< 0.17	< 0.033	< 0.033
W	*EL*	6.7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 5.0	< 1.0	< 1.0
W	*HE*	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 1.6	< 1.6	< 0.33	< 0.33
M	*LE*	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.17	< 0.17	< 0.033	< 0.033
M	*MA*	< 0.67	4.4	< 0.67	< 0.67	< 0.67	< 0.67	< 3.3	< 3.3	< 0.67	< 0.67
C	*RE*	0.21	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.17	< 0.17	< 0.033	< 0.033

TCLP Volatiles Analysis, ppm

LAB	SITE	benzene	CCl4	Clbenz	CHCl3	1.4-DCIB	1.2-DCA	1,1-DCE	MEK	PCE	TCE	VChloride
	Reg. Limit	0.5	0.5	100	6	7.5	0.5	0.7	200	0.7	0.5	0.2
M	*CL*	< 0.10	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	< 0.10	< 2.0	0.61	< 0.10	< 0.20
W	*DE*	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 2.0	0.16	< 0.10	< 0.20
W	*EL*	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	3.9	2.8	< 0.10	< 0.20
W	*HE*	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 2.0	< 0.10	0.49	< 0.20
M	*LE*	< 0.10	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	< 0.10	< 2.0	0.58	< 0.10	< 0.20
M	*MA*	0.15	< 0.10	< 0.10	0.41	< 0.20	< 0.10	< 0.10	< 2.0	0.15	< 0.10	< 0.20
C	*RE*	0.12	< 0.05	< 0.05	< 0.05	0.38	< 0.05	< 0.05	1.3	0.27	< 0.05	< 0.1

Dumpster Mud Wastes

Physical Properties and TCLP Metals Analysis, ppm

B	SITE	pH	SG	FP	As	Ba	Cd	Cr	Pb	Hg	Se	Ag
	Reg Limit	<2 or >10	na	< 100	5	100	1	5	5	0.2	1	5
I	CL	10	na	115	< 0.5	0.85	0.8	0.06	2.2	0.002	< 0.2	< 0.01
/	DE	7	na	80	< 0.05	1	0.84	< 0.05	570	< 0.01	< 0.05	< 0.05
/	EL	8	na	115	< 0.05	0.9	1	< 0.05	1.3	< 0.01	< 0.05	< 0.05
I	LE	6.5	na	85	< 0.5	0.47	2	0.01	1.3	< 0.001	< 0.2	< 0.01
:	NE	7.9	1.2	85	< 1	0.41	2.8	0.02	4.6	< 0.002	< 1	< 0.5
I	CL	7.5	na	> 160	< 0.5	0.28	1.3	0.16	8.8	< 0.001	< 0.2	< 0.01

TCLP Semi Volatiles Analysis, ppm

ID	SITE	cresol	2,4-DNT	Cl6-benz	Cl6-13-but	Cl6-eth	nitrobenz	Cl5-phenol	pyridine	2,4,5-TCP	2,4,6-TCP
	Reg Limit	200	0.13	0.13	0.5	3	2	100	5	400	2
W	CL	10	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 1.7	< 1.7	< 0.33	< 0.33
N	DE	5	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.17	< 0.17	< 0.033	< 0.033
N	EL	96	< 0.091	< 0.091	< 0.091	< 0.091	< 0.091	< 0.46	< 0.46	< 0.091	< 0.091
W	LE	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.17	< 0.17	< 0.033	< 0.033
C	NE	0.88	< 0.066	< 0.066	< 0.066	< 0.066	< 0.066	< 0.34	< 0.34	< 0.066	< 0.066
M	CL	22	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 3.3	< 3.3	< 0.67	< 0.67

TCLP Volatiles Analysis, ppm

AB	SITE	benzene	CCl4	Clbenz	CHCl3	1,4-DClB	1,2-DCA	1,1-DCE	MEK	PCE	TCE	VChloride
	Reg Limit	0.5	0.5	100	6	7.5	0.5	0.7	200	0.7	0.5	0.2
M	CL	0.11	< 0.10	< 0.10	< 0.10	< 0.20	< 0.10	< 0.10	< 2.0	0.96	< 0.10	< 0.20
W	DE	0.52	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 2.0	< 0.10	< 0.10	< 0.20
W	EL	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 2.0	0.16	< 0.10	< 0.20
M	LE	< 0.10	< 0.10	< 0.10	< 0.10	0.52	< 0.10	< 0.10	< 2.0	0.64	< 0.10	< 0.20
C	NE	0.1	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	15	0.17	0.14	< 0.1
M	CL	< 0.10	0.17	4.3	< 0.10	> 4.4	< 0.10	< 0.10	< 2.0	3.6	0.45	< 0.20

Dumpster Mud Wastes

Volatile Organics (EPA 8240) Analysis, ppm

Parameter LAB	SITE	CH3Cl	CH3Br	C2H3Cl	C2H5Cl	CH2Cl2	acetone	CS2	1.1-DCE	1.1-DCA	1.2-DCE	CHCl3
M	CL	< 100	< 100	< 100	< 100	< 50	< 1000	< 50	< 50	< 50	< 50	29
W	DE	< 10	< 10	< 10	< 10	< 5.0	< 100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
W	EL	< 110	< 110	< 110	< 110	< 55	< 1100	< 55	< 55	< 55	< 55	< 55
M	LE	< 330	< 330	< 330	< 330	610	< 3300	< 170	< 170	< 170	< 170	< 170
C	RE	< 1000	< 1000	< 1000	< 1000	< 500	< 10000	< 500	< 500	< 500	< 500	< 500

Parameter LAB	SITE	1,2-DCA	MEK	1.1.1-TCA	CCl4	v-acetate	CHBrCl2	1.2-DCPA	1.3-DCPE	TCE	CHBr2Cl	1.1.2-TCA
M	CL	< 50	< 1000	48	< 50	< 500	< 50	< 50	< 50	< 50	< 50	< 50
W	DE	< 5.0	< 100	11	< 5.0	< 50	< 5.0	< 5.0	< 5.0	6.4	< 5.0	< 5.0
W	EL	< 55	< 1100	750	< 55	< 550	< 55	< 55	< 55	< 55	< 55	< 55
M	LE	< 170	< 3300	1500	< 170	< 1700	< 170	< 170	< 170	< 170	< 170	< 170
C	RE	< 500	< 10000	2300	< 500	< 2500	< 500	< 500	< 500	< 500	< 500	< 500

Parameter LAB	SITE	benzene	2-CVE	1.3-DCPE	CHBr3	Me-2-pen	2-hex'one	PCE	1.1.2.2PCA	toluene	Cl-benz	eth-benz
M	CL	< 50	< 100	< 50	< 50	< 500	< 500	230	< 50	440	< 50	150
W	DE	52	< [illegible]	< 5.0	< 5.0	< 50	< 50	84	< 5.0	550	< 5.0	270
W	EL	< 55	< 110	< 55	< 55	< 550	< 550	740	< 55	500	430	1700
M	LE	< 170	< 330	< 170	< 170	< 1700	< 1700	260	< 170	530	< 170	200
C	RE	< 500	< 1000	< 500	< 500	< 5000	< 5000	1000	< 500	4600	< 500	1800

Parameter LAB	SITE	styrene	xylenes	1.2-DCB	1.3-DCB	1.4-DCB
M	CL	< 50	1200	< 100	< 100	< 100
W	DE	< 5.0	13000	< 5.0	47	< 5.0
W	EL	< 55	1200	250	< 55	100
M	LE	< 170	1400	< 170	< 170	< 170
C	RE	< 500	8700	< 500	< 500	< 500

Dumpster Mud Wastes

Semivolatile Organics (EPA 8270) Analysis, ppm

Parameter		3-nitroanil	acenaphthe	2.4dnitrophe	4nitrophenol	dibenfuran	2.4-DNT	dethphthal	4Clphenphe	fluorene	4-nitroanil	4.6dn2Mep
LAB	SITE											
M	CL	< 11000	< 2200	< 11000	< 11000	< 2200	< 2200	< 2200	< 2200	< 2200	< 11000	< 11000
W	DE	< 15	< 3.0	< 15	< 15	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 15	< 15
W	EL	< 5300	< 1100	< 5300	< 5300	< 1100	< 1100	< 1100	< 1100	< 1100	< 5300	< 5300
M	LE	< 310	< 63	< 310	< 310	< 63	< 63	< 63	< 63	< 63	< 310	< 310
C	NE	< 500	< 100	< 500	< 500	< 100	< 100	< 100	< 100	< 100	< 500	< 500
M	CL	< 12000	< 2500	< 12000	< 12000	< 2500	< 2500	< 2500	< 2500	< 2500	< 12000	< 12000

Parameter		N-nitroso	4Brphenph	Cl6benzene	Cl5phenol	phenanthre	anthracene	d-n-butphl	fluoranthen	pyrene	butbenphth	3.3'Cl2benz
LAB	SITE											
M	CL	< 2200	< 2200	< 2200	< 11000	< 2200	< 2200	< 2200	< 2200	< 2200	< 2200	< 4400
W	DE	< 3.0	< 3.0	< 3.0	< 15	5.2	< 3.0	20	< 3.0	< 3.0	< 3.0	< 6.0
W	EL	< 1100	< 1100	< 1100	< 5300	< 1100	< 1100	< 1100	< 1100	< 1100	< 1100	< 2100
M	LE	< 63	< 63	< 63	< 310	< 63	< 63	< 63	< 63	< 63	< 63	< 130
C	NE	< 100	< 100	< 100	< 500	< 100	< 100	210	< 100	< 100	920	< 200
M	CL	< 2500	< 2500	< 2500	< 12000	< 2500	< 2500	< 2500	< 2500	< 2500	< 2500	< 5100

Parameter		ben[a]anthr	chrysene	b2ethhexph	d-n-octphl	ben[b]fluor	ben[k]fluor	ben[a]pyren	ind[123-cd]	dben[a.h]an	ben[ghi]per
LAB	SITE										
M	CL	< 2200	< 2200	< 2200	< 2200	< 2200	< 2200	< 2200	< 2200	< 2200	< 2200
W	DE	< 3.0	< 3.0	50	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
W	EL	< 1100	< 1100	< 1100	< 1100	< 1100	< 1100	< 1100	< 1100	< 1100	< 1100
M	LE	< 63	< 63	110	< 63	< 63	< 63	< 63	< 63	< 63	< 63
C	NE	< 100	< 100	1700	100	< 100	< 100	< 100	< 100	< 100	< 100
M	CL	< 2500	< 2500	< 2500	< 2500	< 2500	< 2500	< 2500	< 2500	< 2500	< 2500

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USED IMMERSION CLEANER

General Inorganics

		LE USED IC 09 OCT 91		EL USED IC 17 OCT 91		CLUSEIC(New Formula) 10 DEC 91	
Parameter	Units	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit
Specific Gravity at 77 degrees F	g/cc	0.938	-	0.958	-	0.945	-
Ignitability	deg. F	>160	-	>160	-	>160	-
pH	units	9.6	-	9.8	-	9.6	-

		(CHLORINATED) CL USED IC 16 OCT 91	
Parameter	Units	Result	Reporting Limit
Specific Gravity at 77 degrees F	g/cc	1.119	-
Ignitability	deg. F	138	-
pH	units	9.4	-

USED IMMERSION CLEANER

OTC Volatile Organics
TCLP Leachate
Method 8240

		LE USED IC 26 DEC 91		EL USED IC 18 DEC 91		NEW FORMULA CL USED IC 10 DEC 91	
Parameter	Units	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit
Vinyl Chloride	mg/L	ND	6600	ND	5000	ND	5000
1,1 Dichloroethene	mg/L	ND	3300	ND	2500	ND	2500
Chloroform	mg/L	ND	3300	ND	2500	ND	2500
1,2 Dichloroethane	mg/L	ND	3300	ND	2500	ND	2500
2-Butanone	mg/L	ND	6600	ND	5000	ND	5000
Carbon Tetrachloride	mg/L	ND	3300	ND	2500	ND	2500
Trichloroethene	mg/L	ND	3300	ND	2500	ND	2500
Benzene	mg/L	ND	3300	ND	2500	ND	2500
Tetrachloroethene	mg/L	ND	3300	ND	2500	ND	2500
Chlorobenzene	mg/L	ND	3300	ND	2500	ND	2500

		CL USED IC (CHLORINATED) 16 Oct 91	
Parameter	Units	Result	Reporting Limit
Vinyl Chloride	mg/L	ND	200
1,1 Dichloroethene	mg/L	ND	100
Chloroform	mg/L	ND	100
1,2 Dichloroethane	mg/L	ND	100
2-Butanone	mg/L	ND	200
Carbon Tetrachloride	mg/L	ND	100
Trichloroethene	mg/L	ND	100
Benzene	mg/L	ND	100
Tetrachloroethene	mg/L	ND	100
Chlorobenzene	mg/L	ND	100

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USED IMMERSION CLEANER

OTC Semivolatile Organics
TCLP Leachate
Method 8270

		LE USED IC 09 OCT 91		EL USED IC 17 OCT 91		NEW FORMULA CL USED IC 18 DEC 91	
Parameter	Units	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit
Pyridine	mg/L	ND	10.0	ND	200	ND	20.0
1,4-Dichlorobenzene	mg/L	ND	5.0	ND	100	ND	10.0
2-Methylphenol	mg/L	ND	5.0	ND	100	ND	10.0
3/4-Methylphenol	mg/L	ND	5.0	ND	100	ND	10.0
Hexachloroethane	mg/L	ND	5.0	ND	100	ND	10.0
Nitrobenzene	mg/L	ND	5.0	ND	100	ND	10.0
Hexachlorobutadiene	mg/L	ND	5.0	ND	100	ND	10.0
2,4,6-Trichlorophenol	mg/L	ND	5.0	ND	100	ND	10.0
2,4,5-Trichlorophenol	mg/L	ND	25.0	ND	500	ND	50.0
2,4-Dinitrotoluene	mg/L	ND	5.0	ND	100	ND	10.0
Hexachlorobenzene	mg/L	ND	5.0	ND	100	ND	10.0
Pentachlorophenol	mg/L	ND	25.0	ND	500	ND	50.0

		CLUSEIC(Chlorinated) 16 OCT 91	
Parameter	Units	Result	Reporting Limit
Pyridine	mg/L	ND	40000
1,4-Dichlorobenzene	mg/L	72000	20000
2-Methylphenol	mg/L	58000	20000
3/4-Methylphenol	mg/L	54000	20000
Hexachloroethane	mg/L	ND	20000
Nitrobenzene	mg/L	ND	20000
Hexachlorobutadiene	mg/L	ND	20000
2,4,6-Trichlorophenol	mg/L	ND	20000
2,4,5-Trichlorophenol	mg/L	ND	100000
2,4-Dinitrotoluene	mg/L	ND	20000
Hexachlorobenzene	mg/L	ND	20000
Pentachlorophenol	mg/L	ND	100000

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USED IMMERSION CLEANER

TCL Volatile Organics
Method 8240

Parameter	Units	(NEW FORMULA) CL USED IC 10 DEC 91 Result	Reporting Limit
Chloromethane	mg/kg	ND	5000
Bromomethane	mg/kg	ND	5000
Vinyl Chloride	mg/kg	ND	5000
Chloroethane	mg/kg	ND	5000
Methylene chloride	mg/kg	ND	2500
Acetone	mg/kg	ND	5000
Carbon disulfide	mg/kg	ND	2500
1,1-Dichloroethene	mg/kg	ND	2500
1,1-Dichloroethane	mg/kg	ND	2500
1,2-Dichloroethene (cis/trans)	mg/kg	ND	2500
Chloroform	mg/kg	ND	2500
1,2-Dichloroethane	mg/kg	ND	2500
2-Butanone	mg/kg	ND	5000
1,1,1-Trichloroethane	mg/kg	ND	2500
Carbon tetrachloride	mg/kg	ND	2500
Vinyl Acetate	mg/kg	ND	5000
Bromodichloromethane	mg/kg	ND	2500
1,2-Dichloropropane	mg/kg	ND	2500
cis-1,3-Dichloropropene	mg/kg	ND	2500
Trichloroethene	mg/kg	ND	2500
Dibromochloromethane	mg/kg	ND	2500
1,1,2-Trichloroethane	mg/kg	ND	2500
Benzene	mg/kg	ND	2500
trans-1,3-Dichloropropene	mg/kg	ND	2500
2-Chloroethyl vinyl ether	mg/kg	ND	5000
Bromoform	mg/kg	ND	2500
4-Methyl-2-pentanone	mg/kg	ND	5000
2-Hexanone	mg/kg	ND	5000
1,1,2,2-Tetrachloroethane	mg/kg	ND	2500
Tetrachloroethene	mg/kg	ND	2500
Toluene	mg/kg	ND	2500
Chlorobenzene	mg/kg	ND	2500
Ethylbenzene	mg/kg	ND	2500
Styrene	mg/kg	ND	2500
Xylenes (total)	mg/kg	ND	2500

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USED IMMERSION CLEANER

TCL Semivolatile Organics
Method 8270

Parameter	Units	NEW FORMULA CL USED IC 10 DEC 91 Result	Reporting Limit
Phenol	mg/kg	ND	10000
bis(2-Chlorethyl) ether	mg/kg	ND	10000
2-Chlorophenol	mg/kg	ND	10000
1,3-Dichlorobenzene	mg/kg	ND	10000
1,4-Dichlorobenzene	mg/kg	ND	10000
Benzyl alcohol	mg/kg	ND	10000
1,2-Dichlorobenzene	mg/kg	ND	10000
2-Methylphenol	mg/kg	ND	10000
bis(2-Chloroisopropyl)-ether	mg/kg	ND	10000
4-Methylphenol	mg/kg	ND	10000
N-Nitroso-di-n-propylamine	mg/kg	ND	10000
Hexachloroethane	mg/kg	ND	10000
Nitrobenzene	mg/kg	ND	10000
Isophorone	mg/kg	ND	10000
2-Nitrophenol	mg/kg	ND	10000
2,4-Dimethylphenol	mg/kg	ND	10000
Benzoic acid	mg/kg	ND	50000
bis(2-Chloroethoxy)-methane	mg/kg	ND	10000
2,4-Dichlorophenol	mg/kg	ND	10000
1,2,4-Trichlorobenzene	mg/kg	ND	10000
Napthalene	mg/kg	47000	10000
4-Chloroaniline	mg/kg	ND	10000
Hexachlorobutadiene	mg/kg	ND	10000
4-Chloro-3-methylphenol	mg/kg	ND	10000
2-Methylnaphthalene	mg/kg	ND	10000
Hexachlorocyclopentadiene	mg/kg	ND	10000
2,4,6-Trichlorophenol	mg/kg	ND	10000
2,4,5-Trichlorophenol	mg/kg	ND	50000
2-Chloronapthalene	mg/kg	ND	10000
2-Nitroaniline	mg/kg	ND	50000
Dimethyl phthalate	mg/kg	ND	10000
Acenaphthylene	mg/kg	ND	10000
3-Nitroaniline	mg/kg	ND	50000
Acenaphthene	mg/kg	ND	10000
2,4-Dinitrophenol	mg/kg	ND	50000
4-Nitrophenol	mg/kg	ND	50000

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USED IMMERSION CLEANER

- continued from previous page -

Dibenzofuran	mg/kg	ND	10000
2,4 - Dinitrotoluene	mg/kg	ND	10000
2,6 - Dinitrotoluene	mg/kg	ND	10000
Diethyl phthalate	mg/kg	ND	10000
4 - Chlorophenyl phenyl ether	mg/kg	ND	10000
Flourene	mg/kg	ND	10000
4 - Nitroaniline	mg/kg	ND	50000
4,6 - Dinitro- 2 - Methylphenol	mg/kg	ND	50000
N - Nitrosodiphenylamine	mg/kg	ND	10000
4- Bromophenyl phenyl ether	mg/kg	ND	10000
Hexachlorobenzene	mg/kg	ND	10000
Pentachlorophenol	mg/kg	ND	50000
Phenanthrene	mg/kg	ND	10000
Anthracene	mg/kg	ND	10000
Di - n - butyl phthalate	mg/kg	ND	10000
Flouranthene	mg/kg	ND	10000
Pyrene	mg/kg	ND	10000
Butyl benzyl phthalate	mg/kg	ND	10000
3,3' - Dichlorobenzidine	mg/kg	ND	20000
Benzo (a) anthracene	mg/kg	ND	10000
bis(2 - Ethylhexyl) phthalate	mg/kg	ND	10000
Chrysene	mg/kg	ND	10000
Di - n - octyl phthalate	mg/kg	ND	10000
Benzo (b) flourenthene	mg/kg	ND	10000
Benzo (k) flouranthene	mg/kg	ND	10000
Benzo (a) pyrene	mg/kg	ND	10000
Indeno (1,2,3 - cd) pyrene	mg/kg	ND	10000
Dibenz (a,h) anthracene	mg/kg	ND	10000
Benzo (g,h,i) perylene	mg/kg	ND	10000

USED IMMERSION CLEANER

Total Metals
TCLP Leachate

		LE USED IC 09 OCT 91		EL USED IC 17 OCT 91		CLUSEIC(New Formula) 10 DEC 91	
Parameter	Units	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit
Arsenic	mg/L	ND	5.0	1.8	1.0	2.1	1.0
Barium	mg/L	0.54	0.5	0.58	0.1	1.4	0.1
Cadmium	mg/L	12.9	0.25	9.2	0.05	11.6	0.05
Chromium	mg/L	4.7	0.5	1.5	0.1	50.5	0.1
Lead	mg/L	43.4	2.5	86.8	0.5	55.1	0.5
Mercury	mg/L	ND	0.002	ND	0.002	ND	0.002
Selenium	mg/L	ND	0.5	ND	2.0	ND	0.1
Silver	mg/L	ND	0.5	ND	0.1	0.1	0.1

		CL USED IC CHLORINATED 16 OCT 91	
Parameter	Units	Result	Reporting Limit
Arsenic	mg/L	ND	1.0
Barium	mg/L	3.7	0.1
Cadmium	mg/L	45.6	0.05
Chromium	mg/L	27.8	0.1
Lead	mg/L	159	0.5
Mercury	mg/L	ND	0.002
Selenium	mg/L	ND	0.25
Silver	mg/L	ND	0.1

USED DRYCLEANER MUCK

General Inorganics

		HEUSEDDCMUCK 24 OCT 91		DENTON PERC MUCK 25 OCT 91	
Parameter	Units	Result	Reporting Limit	Result	Reporting Limit
Specific Gravity at 77 degrees F	g/cc	0.976	-	-	-
Ignitability	deg. F	>160	-	-	-
pH	units	5.5	-	5	-
Flash point (PMCC)	deg. F	-	-	>180	-

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USED DRYCLEANER MUCK

OTC Volatile Organics

TCLP Leachate

Method 8240

Parameter	Units	HEUSEDDCMUCK 24 OCT 91 Result	HEUSEDDCMUCK 24 OCT 91 Reporting Limit	DENTON PERC MUCK 25 OCT 91 Result	DENTON PERC MUCK 25 OCT 91 Reporting Limit
Vinyl Chloride	mg/L	ND	170	ND	100
1,1 Dichloroethene	mg/L	ND	84	ND	50
Chloroform	mg/L	ND	84	ND	50
1,2 Dichloroethane	mg/L	ND	84	ND	50
2-Butenone	mg/L	ND	170	ND	500
Carbon Tetrachloride	mg/L	ND	84	ND	50
Trichloroethene	mg/L	ND	84	ND	50
Benzene	mg/L	ND	84	ND	50
Tetrachloroethene	mg/L	490	84	790	50
Chlorobenzene	mg/L	ND	84	ND	50

Enseco
A Corning Company

USED DRYCLEANER MUCK

OTC Semivolatile Organics
TCLP Leachate
Method 8270

		HEUSEDDCMUCK 24 OCT 91		DENTON PERC MUCK 25 OCT 91	
Parameter	Units	Result	Reporting Limit	Result	Reporting Limit
Pyridine	mg/L	ND	4.0	ND	2
1,4-Dichlorobenzene	mg/L	ND	2.0	ND	2
2-Methylphenol	mg/L	ND	2.0	ND	2
3/4-Methylphenol	mg/L	ND	2.0	ND	2
Hexachloroethane	mg/L	ND	2.0	ND	2
Nitrobenzene	mg/L	ND	2.0	ND	2
Hexachlorobutadiene	mg/L	ND	2.0	ND	2
2,4,6-Trichlorophenol	mg/L	ND	2.0	ND	2
2,4,5-Trichlorophenol	mg/L	ND	10.0	ND	2
2,4-Dinitrotoluene	mg/L	ND	2.0	ND	2
Hexachlorobenzene	mg/L	ND	2.0	ND	2
Pentachlorophenol	mg/L	ND	10.0	ND	10

Enseco
A Corning Company

USED DRYCLEANER MUCK

Total Metals

TCLP Leachate

		HEUSEDDCMUCK 24 OCT 91		DENTON PERCMUCK 25 OCT 91	
Parameter	**Units**	**Result**	**Reporting Limit**	**Result**	**Reporting Limit**
Arsenic	mg/L	ND	1.0	ND	0.5
Barium	mg/L	0.12	0.1	0.5	0.1
Cadmium	mg/L	0.15	0.05	ND	0.1
Chromium	mg/L	ND	0.1	1	0.1
Lead	mg/L	ND	0.5	0.8	0.1
Mercury	mg/L	ND	0.002	ND	0.02
Selenium	mg/L	ND	0.5	ND	0.3
Silver	mg/L	ND	0.1	ND	0.1

USED DRYCLEANER BOTTOM

General Inorganics

		HEUSEDDCBOT 23 OCT 91		DENTON PERC COOKER SOLIDS 25 OCT 91	
Parameter	Units	Result	Reporting Limit	Result	Reporting Limit
Specific Gravity at 77 degrees F	g/cc	1.05	-	-	-
Ignitability	deg. F	>160	-	-	-
pH	units	6.3	-	7	-
Flash point (PMCC)	deg. F	-	-	>180	-

USED DRYCLEANER BOTTOMS

OTC Volatile Organics
TCLP Leachate
Method 8240

		HEUSEDDCBOT 23 OCT 91		DENTON PERC COOKER SOLIDS 25 OCT 91	
Parameter	Units	Result	Reporting Limit	Result	Reporting Limit
Vinyl Chloride	mg/L	ND	2000	ND	0.08
1,1 Dichloroethene	mg/L	ND	1000	ND	0.04
Chloroform	mg/L	ND	1000	ND	0.04
1,2 Dichloroethane	mg/L	ND	2000	ND	0.04
2-Butanone	mg/L	ND	1000	ND	0.4
Carbon Tetrachloride	mg/L	ND	1000	ND	0.04
Trichloroethene	mg/L	ND	1000	ND	0.04
Benzene	mg/L	ND	1000	ND	0.04
Tetrachloroethene	mg/L	4800	1000	0.9	0.04
Chlorobenzene	mg/L	ND	1000	ND	0.04

USED DRYCLEANER BOTTOM

OTC Semivolatile Organics
TCLP Leachate
Method 8270

		HEUSEDDCBOT 19 DEC 91		DENTON PERC COOKER SOLIDS 25 OCT 91	
Parameter	Units	Result	Reporting Limit	Result	Reporting Limit
Pyridine	mg/L	ND	2.0	ND	0.04
1,4-Dichlorobenzene	mg/L	ND	1.0	ND	0.04
2-Methylphenol	mg/L	ND	1.0	0.34	0.04
3/4-Methylphenol	mg/L	ND	1.0	0.34	0.04
Hexachloroethane	mg/L	ND	1.0	ND	0.04
Nitrobenzene	mg/L	ND	1.0	ND	0.04
Hexachlorobutadiene	mg/L	ND	1.0	ND	0.04
2,4,6-Trichlorophenol	mg/L	ND	1.0	ND	0.04
2,4,5-Trichlorophenol	mg/L	ND	5.0	ND	0.04
2,4-Dinitrotoluene	mg/L	ND	1.0	ND	0.04
Hexachlorobenzene	mg/L	ND	1.0	ND	0.04
Pentachlorophenol	mg/L	ND	5.0	ND	0.2

USED DRY CLEANER BOTTOMS

Total Metals

TCLP Leachate

		HEUSEDDCBOT 23 OCT 91		CENTON PERC COOKER SOLIDS 25 OCT 91	
Parameter	Units	Result	Reporting Limit	Result	Reporting Limit
Arsenic	mg/L	ND	1.4	ND	0.5
Barium	mg/L	1.6	0.14	0.4	0.1
Cadmium	mg/L	0.19	0.063	0.7	0.1
Chromium	mg/L	17.4	0.14	0.2	0.1
Lead	mg/L	4.9	0.69	55	0.1
Mercury	mg/L	ND	0.011	ND	0.02
Selenium	mg/L	ND	0.28	ND	0.3
Silver	mg/L	ND	0.14	ND	0.1

Paint Gun Cleaner Wastes

Physical Properties and TCLP Analysis, ppm

Parameter	*Reg. Limit*	*# Samp*	*Avg*	*Min*	*Max*
pH	<2 or >10	2	6.3	6.0	6.5
SG	na	2	0.894	0.851	0.937
FP	< 100	2	75	75	75
As	5	2	0.00	0.00	0.00
Ba	100	2	0.80	0.60	1.00
Cd	1	2	0.36	0.00	0.72
Cr	5	2	0.46	0.21	0.72
Pb	5	2	1.35	0.30	2.40
Hg	0.2	2	0.00	0.00	0.00
Se	1	2	0.00	0.00	0.00
Ag	5	2	0.00	0.00	0.00
cresol	200	2	4.85	0.00	9.70
2.4-DNT	0.13	2	0.00	0.00	0.00
Cl6-benz	0.13	2	0.00	0.00	0.00
Cl6-13-but	0.5	2	0.00	0.00	0.00
Cl6-eth	3	2	0.00	0.00	0.00
nitrobenz	2	2	0.00	0.00	0.00
Cl5-phenol	100	2	0.00	0.00	0.00
pyridine	5	2	0.00	0.00	0.00
2.4.5-TCP	400	2	0.00	0.00	0.00
2.4.6-TCP	2	2	0.00	0.00	0.00
benzene	0.5	2	0.16	0.14	0.18
CCl4	0.5	2	0.00	0.00	0.00
Clbenz	100	2	0.00	0.00	0.00
CHCl3	6	2	0.00	0.00	0.00
1.4-DClB	7.5	2	0.00	0.00	0.00
1.2-DCA	0.5	2	0.06	0.00	0.12
1.1-DCE	0.7	2	0.00	0.00	0.00
MEK	200	2	2100.00	200.00	4000.00
PCE	0.7	2	0.31	0.00	0.61
TCE	0.5	2	0.80	0.00	1.60
VChloride	0.2	2	0.00	0.00	0.00

Less than values are treated as zeros in the statistical analysis
Greater than values are treated as the value in the statistical analysis

Paint Gun Cleaner Wastes

Semivolatile Organics (EPA 8270) Analysis, ppm

Parameter		phenol	b-2Cl-ethr	2Cl-phenol	1.3-DClB	1.4-DClB	benzyl 'ol	1.2-DClB	2Me-pheno	b-2Cl-IPE	4Me-pheno	N-nitroso
LAB	*SITE*											
W	*DE*	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000
W	*DO*	< 1100	< 1100	< 1100	< 1100	< 1100	< 2100	< 1100	< 1100	< 1100	< 1100	< 1100

Parameter		C2Cl6	nitrobenz	isophorone	2nitroph'ol	2.4Meph'ol	benz acid	b-2Clethox	2.4-dClph	1.2.4-TClB	Naph'ene	4-Clanilline
LAB	*SITE*											
W	*DE*	< 1000	< 1000	< 1000	< 1000	< 1000	< 5000	< 1000	< 1000	< 1000	< 1000	< 1000
W	*DO*	< 1100	< 1100	< 1100	< 1100	< 1100	< 5300	< 1100	< 1100	< 1100	< 1100	< 2100

Parameter		Cl6butadien	4Cl3Mephnl	2-Menaph	Cl6cycpent	2.4.6tClph	2.4.5tClph	2-Clnaph	2-nitroanil	Me2phthal	acenaphthy	2.6-DNT
LAB	*SITE*											
W	*DE*	< 1000	< 1000	< 1000	< 1000	< 1000	< 5000	< 1000	< 5000	< 1000	< 1000	< 1000
W	*DO*	< 1100	< 2100	< 1100	< 1100	< 1100	< 1100	< 1100	< 5300	< 1100	< 1100	< 1100

Parameter		3-nitroanil	acenaphthe	2.4dnitrophe	4nitrophenol	dibenfuran	2.4-DNT	dethphthal	4Clphenphe	fluorene	4-nitroanil	4.6dn2Mep
LAB	*SITE*											
W	*DE*	< 5000	< 1000	< 5000	< 5000	< 1000	< 1000	< 1000	< 1000	< 1000	< 5000	< 5000
W	*DO*	< 5300	< 1100	< 5300	< 5300	< 1100	< 1100	< 1100	< 1100	< 1100	< 5300	< 5300

Parameter		N-nitroso	4Brphenph	Cl6benzene	Cl5phenol	phenanthre	anthracene	d-n-butphl	fluoranthen	pyrene	butbenphth	3.3'Cl2benz
LAB	*SITE*											
W	*DE*	< 1000	< 1000	< 1000	< 5000	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000	< 2000
W	*DO*	< 1100	< 1100	< 1100	< 5300	< 1100	< 1100	< 1100	< 1100	< 1100	1600	< 2100

Parameter		ben[a]anthr	chrysene	b2ethhexph	d-n-octphl	ben[b]fluor	ben[k]fluor	ben[a]pyren	ind[123-cd]	diben[a.h]an	ben[ghi]per
LAB	*SITE*										
W	*DE*	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000
W	*DO*	< 1100	< 1100	< 1100	< 1100	< 1100	< 1100	< 1100	< 1100	< 1100	< 1100

EXHIBIT 2, CONT.

TEI ANALYTICAL, INC.

7177 NORTH AUSTIN • NILES, ILLINOIS • 60648 • 312/647-1345

November 29, 1989

LABORATORY REPORT

#3995

Safety-Kleen Corporation

TCLP Organics

All results are expressed as ppm unless otherwise indicated.
LT = Less Than
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	TEI-70003 Crude Feed from 2nd Trial at C/R
Acrylonitrile	LT 0.5
Benzene	2.5
Bis 2 Chloroethyl Ether	LT 0.05
Carbon Disulfide	LT 0.05
Carbon Tetrachloride	LT 0.05
Chlorobenzene	LT 0.05
Chloroform	LT 0.05
o-Cresol	LT 0.5
m-Cresol	LT 0.5
p-Cresol	LT 0.5
1,2 Dichlorobenzene	LT 0.5
1,4 Dichlorobenzene	LT 0.5
1,2 Dichloroethane	LT 0.05
1,1 Dichloroethylene	LT 0.05
2,4 Dinitrotoluene	LT 0.5
Hexachlorobenzene	LT 0.5
Hexachlorobutadiene	LT 0.5
Hexachloroethane	LT 0.5
Isobutanol	LT 0.5
Methylene Chloride	LT 0.05
Methyl Ethyl Ketone	LT 0.05
Nitrobenzene	LT 0.5
Pentachlorophenol	LT 0.5
Phenol	LT 0.5
Pyridine	100
1,1,2,2 Tetrachloroethane	LT 0.05
1,1,1,2 Tetrachloroethane	LT 0.05
Tetrachloroethylene PERC	39
2,3,4,6 Tetrachlorophenol	LT 0.5
Toluene	9.5
1,1,1 Trichloroethane	0.15
1,1,2 Trichloroethane	LT 0.05
Trichloroethylene	0.11
2,4,5 Trichlorophenol	LT 0.5
2,4,6 Trichlorophenol	LT 0.5
Vinyl Chloride	LT 0.05

Antifreeze Wastes

Physical Properties and TCLP Metals Analysis, ppm

LAB	SITE	Parameter	pH	SG	FP	As	Ba	Cd	Cr	Pb	Hg	Se	Ag
		Reg. Limit	<2 or >10	na	< 100	5	100	1	5	5	0.2	1	5
IV	HU		7.5	1.04	> 200	< 0.05	< 0.3	< 0.05	< 0.05	0.3	< 0.01	< 0.05	< 0.05
IV	EL		8	1.13	> 200	< 0.05	0.3	< 0.05	< 0.05	< 0.1	< 0.01	< 0.05	< 0.05
IV	IVL		8.5	1.05	> 200	< 0.05	< 0.3	< 0.05	< 0.05	0.2	< 0.01	< 0.05	< 0.05

TCLP Semi Volatiles Analysis, ppm

LAB	SITE	Parameter	cresol	2,4-DNT	Cl6-benz	Cl6-13-but	Cl6-eth	nitrobenz	Cl5-phenol	pyridine	2,4,5-TCP	2,4,6-TCP
		Reg. Limit	200	0.13	0.13	0.5	3	2	100	5	400	2
IV	HU		< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.2	< 0.2	< 0.04	< 0.04
IV	EL		0.2	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.35	< 0.35	< 0.07	< 0.07
IV	IVL		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.05	< 0.05

TCLP Volatiles Analysis, ppm

LAB	SITE	Parameter	benzene	CCl4	Clbenz	CHCl3	1,4-DCB	1,2-DCA	1,1-DCE	MEK	PCE	TCE	VChloride
		Reg. Limit	0.5	0.5	100	6	7.5	0.5	0.7	200	0.7	0.5	0.2
IV	HU		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 2.0	0.13	0.97	< 0.20
IV	EL		0.32	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 2.0	0.12	< 0.10	< 0.20
IV	IVL		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 2.0	0.51	< 0.10	< 0.10

APPENDIX I-B

SPILL HISTORY FOR PEKIN SERVICE CENTER

SPILL HISTORY - PEKIN, IL

4/26/88 - 534 gallons of clean petroleum naphtha. Tank overfill. A composite sample of soil from a 20' x 30' area was analyzed for solvent. It was 94 ppm petroleum naphtha. The area was excavated, and 115 cubic yards of soil were sent to a landfill.

12/1/88 - 1 gallon of waste petroleum naphtha. Leak in tank vent pipe during a hydrostatic test of the underground tank. Solvent would not otherwise have been in the vent pipe. Several drums of soil were removed from the area of the pipe leak .

2/8/89 - 30 gallons of used oil. Tanker truck was overfilled as a result of a faulty valve. The material was released onto frozen ground, so all material was easily recovered by vacuum and oil dry.

2/21/89 - 500 to 1000 gallons of oily water. The release was from a tanker trailer whose legs sank into soft ground, which broke a line open.

The material entered soil approximately 50 feet east of the underground solvent tanks(outside of the east fence, and along the fence.). Some of the material was recovered by a Company oil truck. 129 cubic yards of soil were excavated and sent to a local landfill.

ADDENDUM

SPILL HISTORY - PEKIN, IL

12/26/90	2 gallons of waste oil. During tanker loading operations in subzero conditions, a freeze up in the tanker hose resulted in the release of waste oil and water on to the concrete loading pad. The release was cleaned up with absorbent material.
12/28/90	5 gallons of mineral spirits. The release occurred when the hose separated from the metal connector during loading. The release was over the concrete loading pad and was cleaned up by shoveling the contaminated snow into solvent dumpsters and allowing it to melt, and by the use of sorbents to clean the area.
1/28/91	100 - 150 gallons of oily wastewater. The material was released on to the concrete loading pad and the surrounding snow when water froze in the check valves causing the top of the check valve to pop off. Free product was pumped up and returned to the tank. Contaminated snow and ice was shoveled up, allowed to melt, and placed in the tank. The area was cleaned with oil-dry.

APPENDIX I-C

LIST OF WELLS WITHIN 1.5 MILES
OF PEKIN SERVICE CENTER

County: Tazewell

Township Code: 24N
Range Code: 5W
Section Codes: 8-11, 14-17, 20-23, 27

19 records were found for the specified locations.

Questions : Contact the Illinois State Water Survey's Ground Water Division @ (217)333-7223

Publication: Please cite the Illinois State Water Survey's PICS (Public-Industrial-Commercial) Database in all publications based wholly or partially on this information.

Please Note:

The data in the PICS Database is a listing of municipal and large industrial and commercial wells which are known to the Illinois State Water Survey (ISWS). The information was initially entered from public water supply data and supplemented with the Illinois Water Inventory Project data. This database is updated as additional information is received and verified.

TWN	RNG	SC	PL	OWNER	DRILLER	DATE	PERMIT	DPTH	REC	US	TY	AQ
24N	05W	09	8B	SUPERPOWER #7 (14:1175:2) ABAN	OHIO	10/01/1930		49	OGC	IN	BD	UN
24N	05W	09	8C	SUPERPOWER #4 (64:1620:-)ABAND	OHIO	00/00/1928		60	OGC	IN	BD	UN
24N	05W	09	8C	COMMONWEALTH EDISON WELL #5A	KELLY	00/00/1941		62	O	IN	BD	--
24N	05W	09	8C	COMMONWEALTH EDISON WELL #4A	KELLY	00/00/1943		60	O	IN	BD	--
24N	05W	09	8C	COMMONWEALTH EDISON WELL #3		00/00/1962			O	IN		--
24N	05W	09	8C	COMMONWEALTH EDISON WELL #3A	KELLY WELL CO	00/00/1962		56	O	IN		--
24N	05W	10	1G	ROY L WAGNER		00/00/0000		110	O	DO	--	--
24N	05W	10	3C	ROBERT ORR	GROSCH IRRIGATION	04/16/1991	179-53-91	136	RG	IR	--	UN
24N	05W	10	4H	SPRINGFIELD-PEKIN SAND & GVL	PRICE	00/00/1941		80	OG	IN	--	UN
24N	05W	10	6C	ADWELLCO	GROSCHIRRIGATION	05/10/1979	1083704	108	L	IR	^^	^^
24N	05W	10	6C	ADWELL CORP	GROSCH	05/10/1979	083704	108	RG	IR	--	UN
24N	05W	10	7G	QUAKER OATS #8		05/00/1965		90	CX	IN	--	--
24N	05W	10	7H	CUMMINGS ESTATE	ACME	00/00/1950		107	O	DO	--	--
24N	05W	10	7H	QUAKER OATS #7		01/00/1966		96	CX	IN		--
24N	05W	10	7H	QUAKER OATS #5 (54:1056:-)	LAYNE WESTERN	11/18/1958		90	LCX	IN	BD	UN
24N	05W	10	8D	DEXTER CUMMINGS		00/00/0000		90	O	DO	--	--
24N	05W	10	8H	QUAKER OATS #4 (50:869:-)	LAYNE-WESTERN	09/09/1955		87	LCX	IN	BD	UN
24N	05W	10	8H	QUAKER OATS #3 (43:850:-)	KELLY	10/00/1941		80	LX	IN	BD	--
24N	05W	11	2A	RES FAC MGR SPEC (DRY HOLE)	SAUDER	03/27/1989	139708	86	RG	CM	--	UN
24N	05W	11	2B	VFWPOST1232	BIGGERSTAFF	04/00/1978	1072238	86	L	CM	^^	^^
24N	05W	11	2B	V F W POST 1232 (35:12:2)	BIGGERSTAFF	04/00/1978	072238	86	RG	NC	--	UN
24N	05W	11	3A	NORLIN A HARDT (71:15:1)	BIGGERSTAFF	00/00/1947		106	RGC	DO	--	UN
24N	05W	11	5D	HENRY BEQUEAITH (90:15:2)	EBERT	05/20/1969	NF5915	127	RG	DO	--	UN
24N	05W	11	6C	RAYMOND H ERPS (93:10:2)	EBERT	03/28/1970	NF07723	134	RG	DO	--	UN
24N	05W	11	8D	WM METZER (71:10:2.5)	PRICE	04/00/1940		86	RG	DO	--	UN
24N	05W	11	8E	MESSER		00/00/0000		98	RG	DO	--	--
24N	05W	14		MIKE H DEVER	HOFSTETTER	04/21/1975	033833	58	O	DO	--	--
24N	05W	14	1C	MELVIN GLEICH (ABANDONED)	HOFSTETTER	00/00/1967	003141	116	RG	DO	--	BR
24N	05W	14	1C	MELVIN GLEICK (57:15:2)	SAUDER	05/20/1985	117893	64	RG	DO	BD	UN
24N	05W	14	1H	MELVIN GLEICH	HAMPTON	06/00/1968	NF4023	57	RG	DO	BD	UN
24N	05W	14	2A	GENE CUNNINGHAM (66:8:2)	COPPENBARGER	10/15/1978	080341	87	LX	DO	--	UN
24N	05W	14	2B	JAMES R SEARS (65:5:6)	COPPENBARGER	08/21/1980	095590	76	RG	DO	--	UN
24N	05W	14	2B	ROBERT CUNNINGHAM (64:5:8)	COPPENBARGER	09/07/1984	114148	80	RG	DO	--	UN
24N	05W	14	2C	FRANK PALISHEN (57:14:4)	HOFSTETTER	07/29/1970	NF08847	60	RG	DO	--	UN
24N	05W	14	2D	RAY RANDALL (50:15:4)	HOFSTETTER	08/06/1973	NF20211	55	RG	DO	--	UN
24N	05W	14	2D	WILBUR IRVING (51:15:4)	HOFSTETTER	10/08/1974	032301	63	RG	DO	--	UN
24N	05W	14	3E	ROBERT JONES (59:15:4)	HOFSTETTER	10/20/1972	NF16872	74	RG	DO	--	UN
24N	05W	14	4F	ZEBA HYATT	EBERT	00/00/1965		100	RG	DO	--	UN
24N	05W	14	4F	GLORIANA ESTATES WELL NO 1	EBERT	05/23/1962		66	O	DO	--	--
24N	05W	14	5G	MID AMERICA, INC M & T-KLM	GROSCH	04/16/1988	138950	95	RG	IR	--	UN
24N	05W	14	8E	ADWELL CORPORATION	GROSCH IRRIGATION	08/16/1990	179-202-90	127	RG	IR	--	UN
24N	05W	15	1H	ALBERT F SMITH (35:12:1.5)	ACME	07/26/1972	NF14338	107	RG	DO	--	UN
24N	[illegible]W	15	2G	ALBERT SMITH (71:1250:-)	GROSCH	05/09/1984	111609	116	LX	IR	--	UN
24N	[illegible]W	15	3C	ADWELLCORP	GROSCHIRRIG[illegible]ON	04/15/1982	1102885	115	L	IR	^^	^^
24N	05W	15	3C	ADWELL CORP (53:1250:-)	GROSCH	04/15/1982	102885	115	RG	IR	[illegible]	[illegible]

PART II

PROJECT: 823

PART II

NATURE AND EXTENT OF IMPACTS

RCRA FACILITY INVESTIGATION
PHASE I RELEASE ASSESSMENT WORKPLAN
PEKIN, ILLINOIS SERVICE CENTER

TriHydro Corporation

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Laramie, Wyoming 82070

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CHAPTER II-1

INTRODUCTION

Safety-Kleen Corp. (S-K) has conducted two environmental investigations in the vicinity of the former underground storage tanks (USTs) to support closure of these units. Soil sampling has been conducted in the tank excavation and underlying soils and along the pipe runs to the tanks from a former return and fill station location. The areas where soils have been sampled are shown on Figure II-1-1. No ground-water sampling has been conducted at the facility.

No soil sampling has been conducted at the warehouse solid waste management units (SWMUs). Sampling was conducted at the soil stockpile which resulted from excavation of impacted soils at the oil spill site. The total lead concentration was 34 mg/kg, which is in the range of typical urban background concentrations. The EP-TOX lead concentration was 0.15 mg/L, which is well below the hazardous waste toxicity standard of 5.0 mg/L.

The results of the UST closure soil sampling program are presented in Chapter II-2. The results identify the soil types expected at the SWMUs or AOC, the constituents managed at the facility, and the potential for constituent migration. General ground-water conditions are described in Chapter II-3.

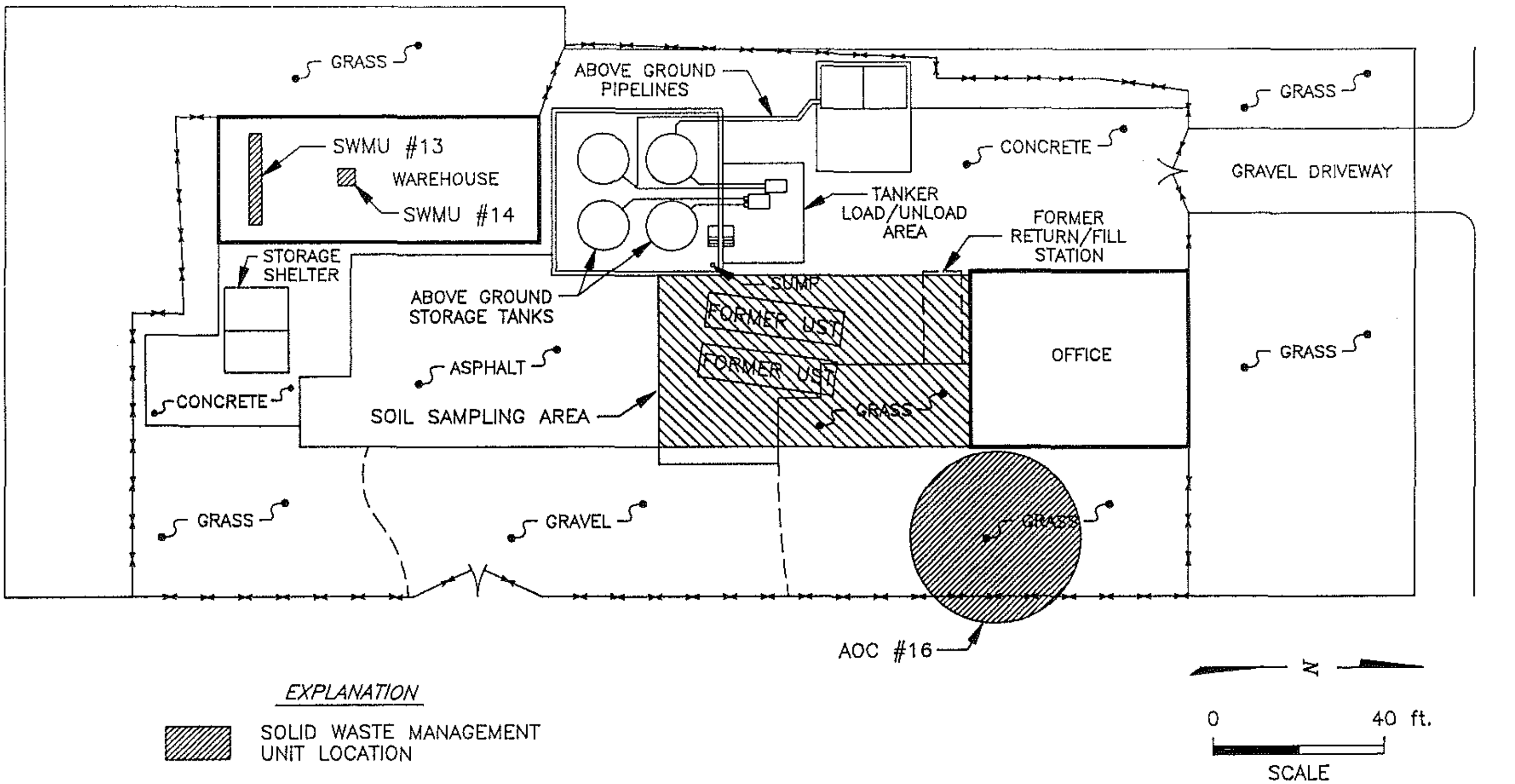

FIGURE II–1–1 :SOIL SAMPLING AREA, SAFETY–KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

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CHAPTER II-2

SOILS CONDITIONS

Regional

The Pekin Service Center is located at an elevation of about 493 feet above mean sea level (ft-msl) in the northern end of the Havana Region (Safety-Kleen Corp., 1993). The Havana Region is a physiographic area described as a wide, low rolling sandy plain bordered to the west by the Illinois River and to the east by glaciated uplands (Walton, 1965).

The regional stratigraphy is presented on Figure II-2-1. The uppermost deposits beneath the site are unconsolidated recent alluvium and stratified Pleistocene glacial deposits of the Wisconsinan and Kansan stages. The uppermost glacial unit is the Wisconsinan outwash. These sediments are described as mostly sand and gravel with beds of pebbly sand. The sand is 60 to 75 percent quartz, 10 to 20 percent feldspar, and 20 to 30 percent lithic fragments, and appears light brown to yellowish brown. The Kansan stage Sankoty sand underlies the Wisconsin drift. These deposits range from fine to very coarse sand with gravel, but are most commonly clean, well sorted, medium to coarse-grained sand. The sand is described as pinkish gray, with 75 percent quartz, 10 to 15 percent feldspar, 10 to 20 percent lithic fragments.

Site Lithology

The site geology description is based on the results of a subsurface investigation presented in the Partial Facility Closure Progress Report (TriHydro, 1991). The interpretation of the site geology is based on site lithologic data and information on regional geology presented in the preceding sections.

Borehole logs from the site are included in Appendix II-A. The shallow sediments underlying the site are:

- 0-9 ft: Tan or red-brown sand, medium grained, with clay interbeds
- 9-23 ft: Tan sand, medium to coarse grained, arkosic, with lithic gravel and pebbles
- 30-33 ft: Gray, fine grained, well sorted sand

UNCONSOLIDATED DEPOSITS

System	Series	STAGE	SUBSTAGE	VALLEY DEPOSITS	UPLAND DEPOSITS
QUATERNARY SYSTEM	PLEISTOCENE SERIES	RECENT		Alluvium, colluvium up to 50' thick	Alluvium, colluvium
		WISCONSINAN	VALDERAN	BEARDSTOWN TERRACE	
			TWOCREEKAN		
			WOODFORDIAN	BATH TERRACE HAVANA TERRACE MANITO TERRACE BLOOMINGTON OUTWASH TERRACE (UNMODIFIED) Underlain by sand & gravel up to 100' thick	Dune sand PEORIA LOESS up to 90' thick RICHLAND LOESS Glacial till up to 125' thick MORTON LOESS
			FARMDALIAN	Not differentiated	FARMDALE SILT
			ALTONIAN		ROXANA SILT
		SANGAMONIAN			Weathered zone
		ILLINOIAN	BUFFALO HART JACKSONVILLE LIMAN		Till, silt, sand, and gravel 40' to 200' thick
		YARMOUTHIAN			Weathered zone
		KANSAN		SANKOTY-MAHOMET SAND 0-175' thick	Till, silt, sand, and gravel up to 50' thick
		AFTONIAN			Weathered zone
		NEBRASKAN		Not differentiated	Till and sand 5' to 15' thick

BEDROCK

SYSTEM	SERIES	GROUP OR FORMATION	LITHOLOGY	THICKNESS (ft.)
PENNSYLVANIAN			Shale, sandstone, coal, limestone	0-700
MISSISSIPPIAN	VALMEYERAN	ST. LOUIS FORMATION	Cherty limestone	0-60
		SALEM FORMATION	Dolomite, sandstone, shale	0-50
		WARSAW FORMATION	Shale	0-90
		KEOKUK-BURLINGTON FMS.	Cherty limestone	200-250
	KINDERHOOKIAN		Shale	200-240
DEVONIAN			Limestone	0-50
SILURIAN			Dolomite	50-250
ORDOVICIAN	CINCINNATIAN	MAQUOKETA GROUP	Shale, dolomite	170-200
	CHAMPLAINIAN	GALENA-PLATTEVILLE GPS.	Dolomite	290-340
		GLENWOOD-ST. PETER FMS.	Sandstone	170-250
OLDER ORDOVICIAN, CAMBRIAN, & PRECAMBRIAN ROCKS				

FIGURE II-2-1 :STRATIGRAPHIC COLUMN OF HAVANA REGION
(from Walker *et al.*, 1965)

- 33-35 ft: Gray sand and sandy gravel with abundant clay.

Ground water was encountered in one borehole at 35 feet below ground surface. The borehole was terminated at the water table.

Based on the site lithologic data and the information on regional geology, the sediments beneath the site are interpreted to be Wisconsinan age outwash. The Sankoty Sand, which underlies much of the Peoria-Pekin area and Havana Region, is absent beneath the site. The thickness of the Quaternary sediments beneath the site is about 100 feet. The clay interbeds from 0 feet to 9 feet suggest that the shallowest sediments may be Lost Creek alluvium. Visual inspection of the site topography indicates that the site is not currently in the Lost Creek flood plain.

Soil Quality

S-K conducted subsurface investigations at the Pekin Service Center in 1991 during closure of the former underground storage tanks (USTs). S-K implemented a pre-excavation soil sampling and analysis program on July 25, 1991, to characterize soil quality in the vicinity of the underground storage tanks (USTs). Following removal of the USTs and associated piping and appurtenances in 1991, soil samples were collected along the former piping runs to provide supplemental information on extent, degree, and characteristics of subsurface degradation. The results of these assessment activities are summarized in this chapter.

Soil Vapor Survey

A soil vapor survey was conducted in March and August of 1991. The total organic vapor (TOV) and combustible gas data can be referenced on Figure II-2-2 and II-2-3. Elevated TOV and combustible gas levels occurred in the vicinity of the former USTs and associated piping. TOV and combustible gas levels in the vicinity of the two solid waste management units (SWMUs) in the warehouse and in the oil spill area east of the former USTs were near or below detection limits except for one slightly elevated TOV concentration (23 parts per million) adjacent to the warehouse.

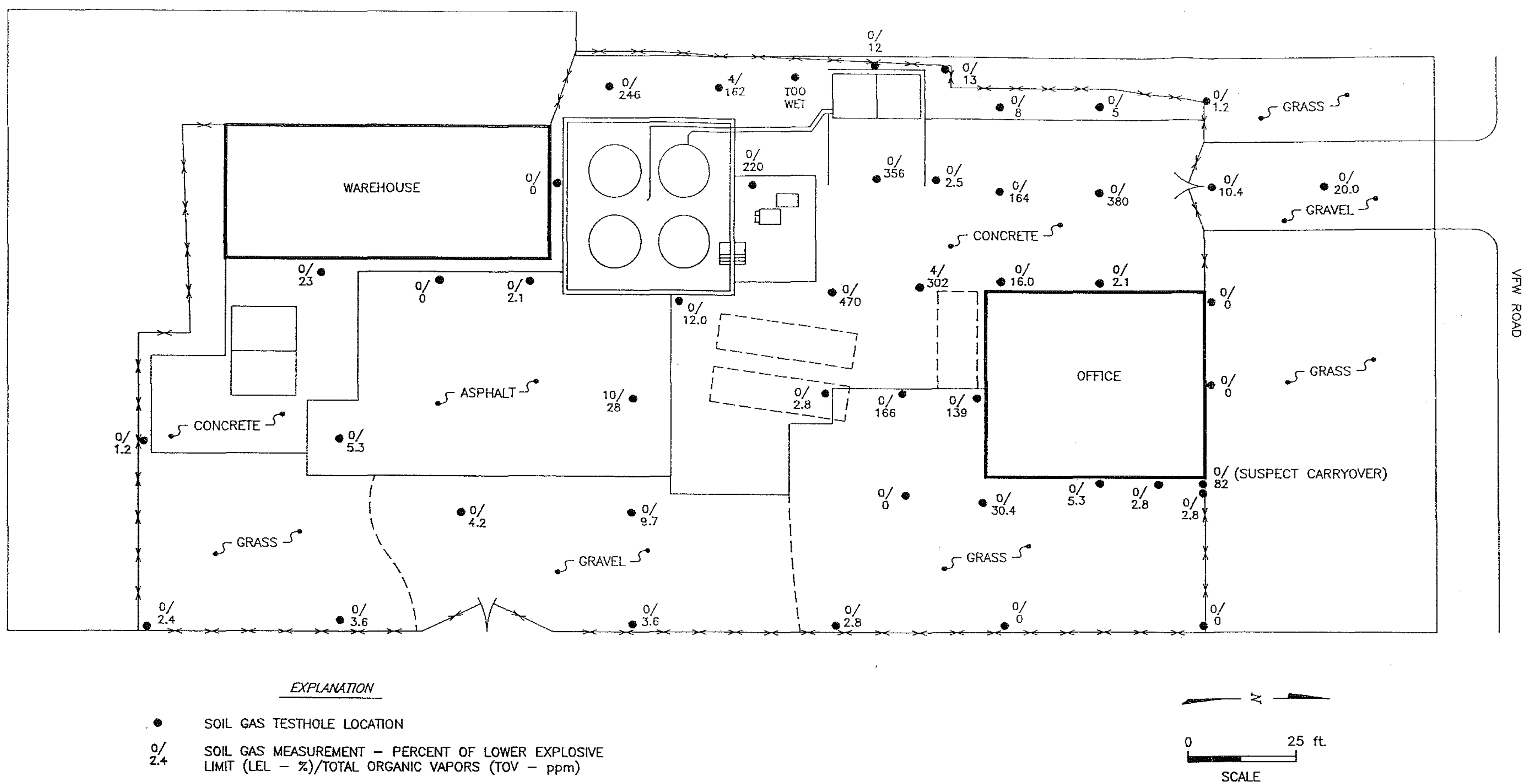

FIGURE II-2-2 :SOIL GAS SURVEY RESULTS, SAFETY–KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS (March 1, 1991)

11X17GAS

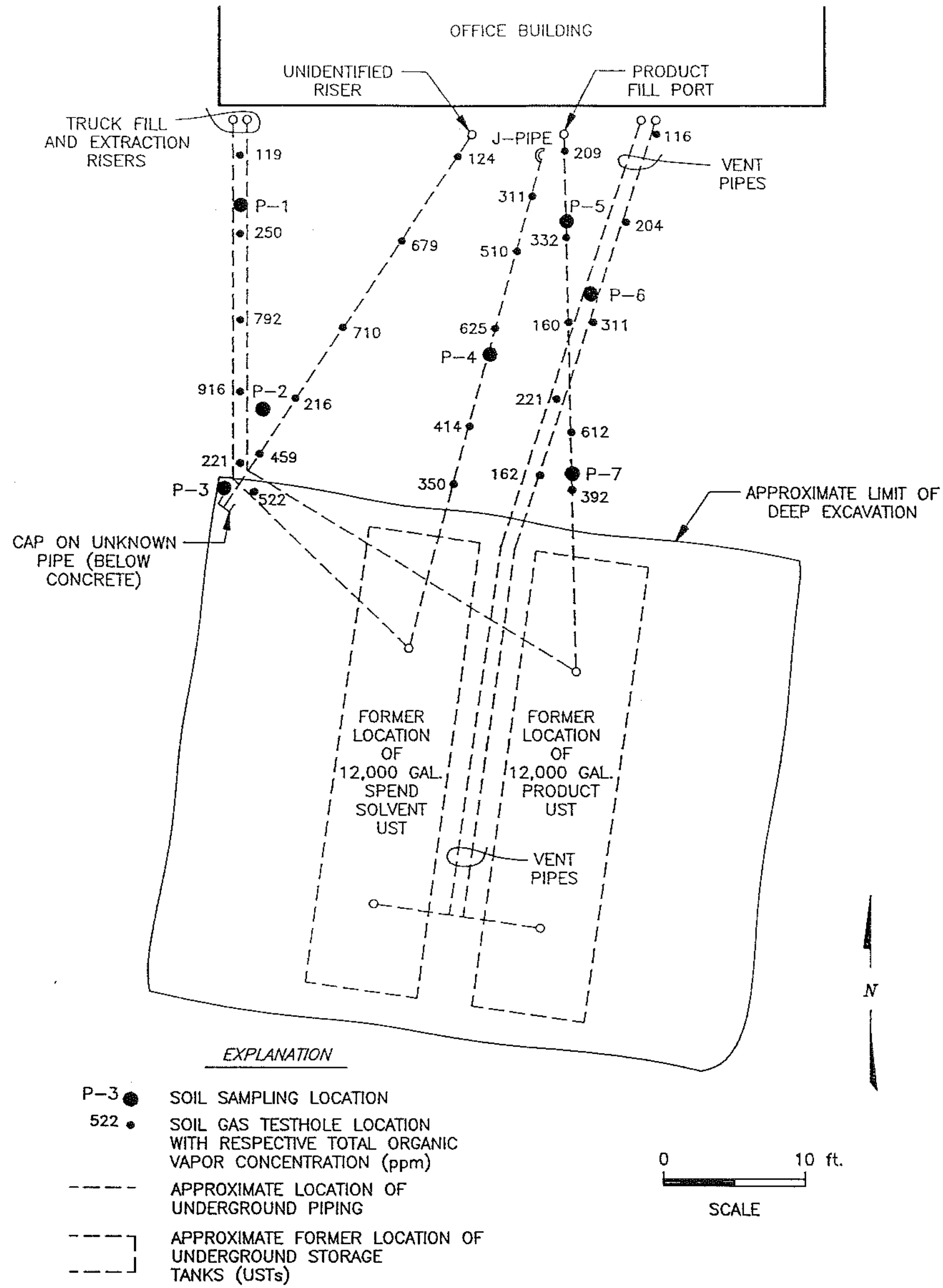

FIGURE II-2-3 :SOIL SAMPLING AND FIELD SCREENING LOCATIONS ALONG PIPING, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS (August 28, 1991)

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Soil Sampling

S-K collected and analyzed 18 soil samples from 12 locations during the July and August 1991 facility closure assessments. The soil sampling locations are shown on figures II-2-3 for the sampling locations along the pipe runs, and II-2-4 for soil borings near the former UST location. The purpose of the soil sampling was to determine the nature, degree, and extent of soil quality degradation. To date, the nature and degree of soil quality degradation have been determined. The lateral and vertical extent of soil quality degradation has not been determined. An Extent of Degradation Workplan was submitted to the Illinois Environmental Protection Agency (IEPA) on September 14, 1993. S-K and IEPA are working out the details of the project at the present time.

Pre-Excavation Soil Quality

Nine soil samples were collected for laboratory analyses from five pre-excavation boreholes. The selection of samples for laboratory analyses was based on the following criteria at each borehole location:

1. The most degraded sample interval based on field screening;

2. The sample interval at least one foot deeper than the invert of the former tank bottoms (approximately 13 feet below ground surface); and/or

3. The deepest sample interval in which field screening indicates the absence of degradation or the capillary fringe/total depth, which ever comes first.

Soil samples from each interval were subjected to field screening for total organic vapors (TOV). Field screening results are summarized in Table II-2-1.

The nine samples were analyzed to characterize the nature and degree of degraded soils in the vicinity of the USTs. These samples were analyzed for the constituents (for characterization of degradation) listed in Table II-2-2. Analyses were performed using EPA methods in accordance with USEPA SW-846, 3rd Edition.

In addition to characterizing the nature and degree of subsurface degradation, one sample [PRE-4 (3.0-5.0)] was analyzed for the applicable hazardous waste characteristics listed in Table II-2-2 to classify the degraded soils for disposal purposes. Sample PRE-4 (3.0-5.0) was selected for

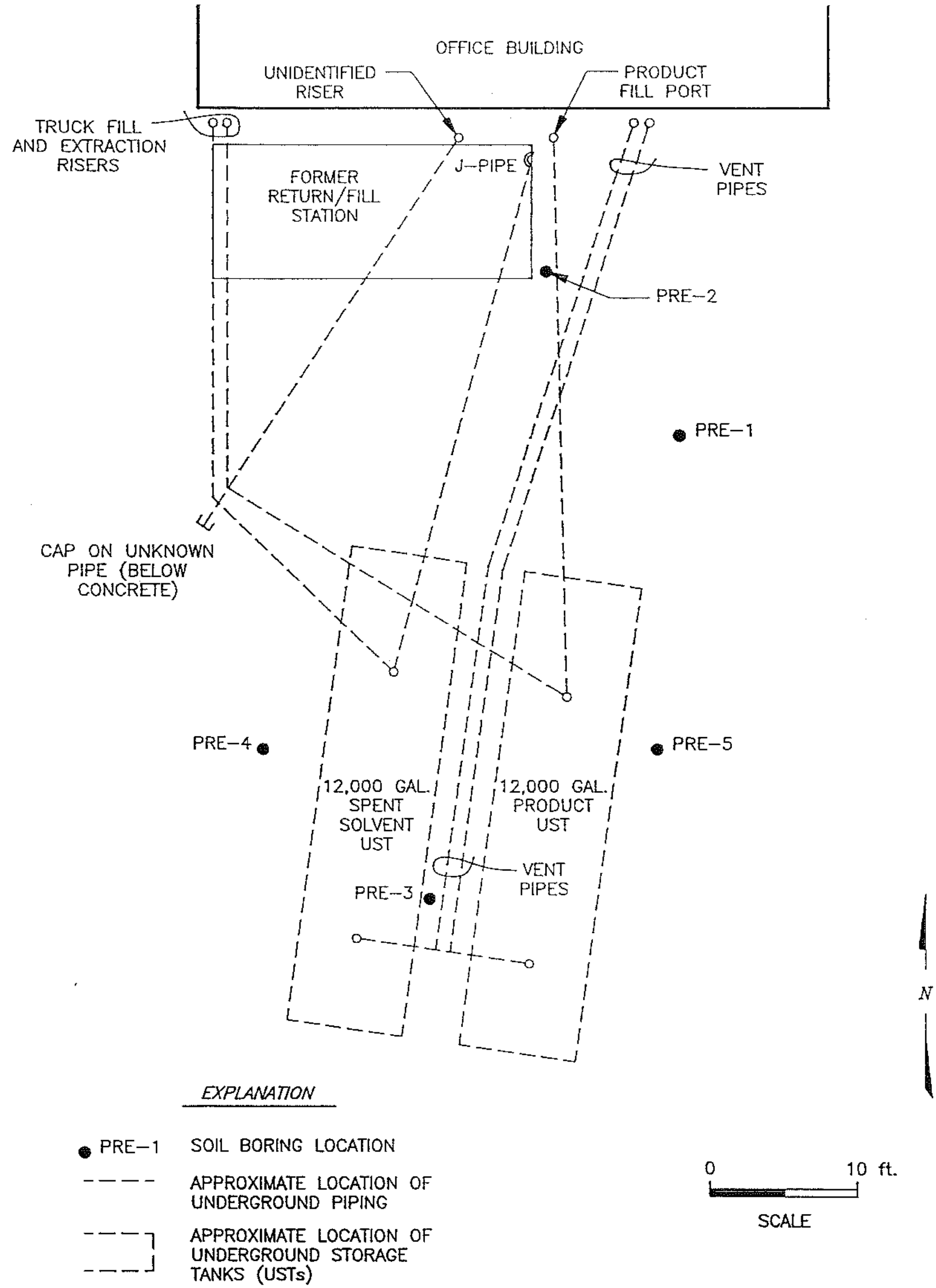

FIGURE II-2-4 :PRE-EXCAVATION SOIL BORING LOCATIONS, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS (July 1991)

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Table II-2-1. Field Screening Results, Pre-Excavation Soil Sampling Program, Partial Facility Closure, Safety-Kleen Corp. Service Center, Pekin, Illinois (July 1991).

Sample Interval (ft-bgs)	Borehole Field Screening Results Total Organic Vapor Concentration (ppm)				
	PRE-1	PRE-2	PRE-3	PRE-4	PRE-5
0-3	15	(13)	542/0	1271	5
3-5	1	11	1	(1822)	6
5-7	1	82	1	1371	3
7-9	1	6	5	679	8
9-11	5	6	(6)	251	3
11-13	6	1	(3)	686	(1)
13-15	(5)	(3)		718	
15-17	6			698	
17-19	(5)			601	
19-21				673	
21-23				390	
23-25				25	
25-27				15	
27-29				8	
29-31				--	
31-33				34	
33-35				(49)	

1. ft-bgs indicates feet below ground surface
2. Parantheses indicate sample selected for laboratory analyses.

Table II-2-2. Partial Facility Closure Sampling Program, Constituents and Analytical Methods, Safety-Kleen Corp. Service Center, Pekin, Illinois.

Constituents	Analytical Methods
Characterization of Degradation	
Mineral Spirits	Modified 8015
Volatile Organic Compounds (41)	8240
Semi-Volatile Organic Compounds	8270
Base-Neutral Extractable (49)	
Acid Extractable (11)	
TCLP Metals[b]	1311
Barium	6010
Cadmium	7131
Chromium	7191
Lead	7421
Characterization for Disposal	
TCLP Metals (8)	1311/6000 series
TCLP Volatile Organic Compounds (10)	1311/8240
TCLP Semi-Volatile Organic Compounds (11)	1311/8270
Sulfide Reactivity	Chap. 7.3.4.1
Cyanide Reactivity	Chap. 7.3.3.2
Corrosivity	9045
Ignitability	Modified Open Cup
Paint Filter	9095

[a] Analytical methods based on USEPA SW-846.
[b] Metals analyses performed using the toxicity characteristics leaching procedure (TCLP).

disposal characterization because this soil interval exhibited highest field screening measurements.

Laboratory analytical results for the pre-excavation soil samples are summarized in Table II-2-3 (nature and degree) and Table II-2-4 (disposal characteristics). Laboratory analytical reports are included in the Partial Facility Closure Progress Report, dated October 11, 1991. The results of the pre-excavation soil sampling are discussed below.

Mineral Spirits

Mineral spirits was detected in samples from boreholes PRE-2 and PRE-4. Analysis of the two samples from PRE-2 (1.0-3.0') resulted in mineral spirits concentrations of 960 and 565 mg/kg. However, mineral spirits was nondetectable in the deeper sample from PRE-2 (13.0-15.0'). The analytical data also indicate mineral spirits was detectable in the shallow PRE-4 (3.0-5.0') samples at an average concentration of 32 mg/kg, but non-detectable in the deeper PRE-4 (33.0-35.0') sample.

Volatile Organic Compounds

VOCs were nondetectable in all of the pre-excavation borehole samples except PRE-2 (13.0-15.0'). Ethylbenzene (0.013 mg/kg) and xylenes (0.048 mg/kg) were detected in the deepest sample from borehole PRE-2 (13.0-15.0'). Ethylbenzene and xylenes can be present in minor amounts in mineral spirits. S-K mineral spirits consists of mainly C9 to C11 aliphatic (89%) and cyclic hydrocarbons (8-14%).

Semi-Volatile Organic Compounds

The pre-excavation borehole samples were analyzed for a total of 59 semi-volatile base-neutral/acid extractable compounds (SVOCs). With the exception of two phthalate esters, no SVOCs were detected in any of the nine pre-excavation borehole samples. Bis(2-ethylhexyl)phthalate and di-n-butyl-phthalate were reported on the laboratory data sheets at levels below the Method 8270 PQL for low-level soils (0.66 mg/kg) in SW-846. S-K believes these compounds were introduced during sampling or laboratory analysis, because they are common plasticizers.

Inorganic Constituents

The pre-excavation soil samples were analyzed for barium, cadmium, chromium, and lead using the toxicity characteristic

Table II-2-3. Soil Quality Data, Pre-Excavation Soil Sampling Program, Safety-Kleen Corp. Service Center, Pekin, Illinois (July 1991).

Sample Location and Depth (ft-bgs)	TCLP Metals (mg/L) Barium	Cadmium	Chromium	Lead	Volatile Organic Compounds (mg/kg)	Semi-Volatile Organic Compounds (mg/kg)	Mineral Spirits (mg/kg)
PRE-1 13.5-15.0	0.30	ND(0.10)	ND(0.10)	ND(0.10)	All ND	bis(2-ethylhexyl)phthalate 0.150 Di-n-butylphthalate 0.050 All others ND	ND(10.0)
PRE-1 17.5-19.5	0.35	ND(0.10)	ND(0.10)	ND(0.10)	All ND	bis(2-ethylhexyl)phthalate 0.080 Di-n-butylphthalate 0.050 All others ND	ND(10.0)
PRE-2 1.0-3.0	1.44	ND(0.10)	ND(0.10)	ND(0.10)	All ND	bis(2-ethylhexyl)phthalate 0.420 Di-n-butylphthalate 0.120 All others ND	960.0
PRE-2 DUP 1.0-3.0							565.0
PRE-2 13.0-15.0	0.49	ND(0.10)	ND(0.10)	ND(0.10)	Ethyl benzene 0.013 m-Xylene 0.035 o&p-Xylene 0.013 All others ND	bis(2-ethylhexyl)phthalate 0.060 All others ND	ND(10.0)
PRE-3 9.0-11.0	0.38	ND(0.10)	ND(0.10)	ND(0.10)	All ND	bis(2-ethylhexyl)phthalate 0.120 Di-n-butylphthalate 0.170 All others ND	ND(10.0)
PRE-3 11.0-13.0	0.34	ND(0.10)	ND(0.10)	ND(0.10)	All ND	bis(2-ethylhexyl)phthalate 0.060 Di-n-butylphthalate 0.060 All others ND	ND(10.0)
PRE-4 3.0-5.0	1.68	ND(0.10)	ND(0.10)	ND(0.10)	All ND		29.2
PRE-4 DUP 3.0-5.0							34.7
PRE-4 33.0-35.0	0.66	ND(0.10)	ND(0.10)	ND(0.10)	All ND	bis(2-ethylhexyl)phthalate 0.120 Di-n-butylphthalate 0.060 All others ND	ND(10.0)
PRE-5 11.0-13.0	0.30	ND(0.10)	ND(0.10)	ND(0.10)	All ND	bis(2-ethylhexyl)phthalate 0.090 Di-n-butylphthalate 0.050 All others ND	ND(10.0)

Notes:

1. TCLP indicates Toxicity Characteristic Leaching Procedure (40 CFR 261.24).
2. ND indicates constituent not detected at a level above the PQL or detection limit in parentheses.
3. PQL indicates practical quantitation limit.
4. ft-bgs indicates feet below ground surface.
5. DUP indicates duplicate sample submitted for analysis as QA/QC check on laboratory data.

Table II-2-4. Soil Quality Disposal Characteristics, Pre-Excavation Soil Sampling Program, Safety-Kleen Corp. Service Center, Pekin, Illinois (July 1991).

Characteristic	Borehole Sample PRE-4 (3.0-5.0 feet)
TCLP - Metals (mg/L)	
Arsenic	0.13
Barium	1.68
Cadmium	ND(0.10)
Chromium	ND(0.10)
Lead	ND(0.10)
Selenium	ND(0.10)
Silver	ND(0.10)
Mercury	0.0002
TCLP - Volatile Organic Compounds (10)	All ND
TCLP - Semi-Volatile Organic Compounds (11)	All ND
Sulfide Reactivity (ppm)	ND(1.0)
Cyanide Reactivity (ppm)	ND(0.01)
Corrosivity (pH-Std. Units)	6.46
Ignitability (°F)	>212
Paint Filter	No Free Liquids

Notes:

1. TCLP indicates Toxicity Characteristic Leaching Procedures (40 CFR 261.24).

2. ND indicates constituent not detected at a level above the PQL or detection limit in parentheses.

3. PQL indicates practical quantification limit.

leaching procedure (TCLP-40 CFR 261.24). Extractable barium was detected in all nine of the pre-excavation soil samples at concentrations ranging from 0.30 to 1.68 mg/L. Note that the TCLP concentrations of barium were less than the USEPA Maximum Contaminant Level (May 1993) of 2.0 mg/L. Extractable cadmium, chromium, and lead were not detected in the nine pre-excavation soil samples.

Disposal Characterization

The soil was determined to be non-hazardous, based on the results of the soil disposal characterization analysis (Table II-2-4). All of the applicable hazardous waste characteristics of sample PRE-4 (3.0-5.0) were below (or within for corrosivity) the regulatory levels (35 IAC Part 721). In addition, this sample contained no free liquids based on the paint filter test.

Pipe Run Soil Quality

Seven soil samples were collected from beneath the piping runs to provide supplemental information on the extent, degree, and characteristics of subsurface degradation. The pipe run samples were selected from areas which exhibited the highest TOV concentration based on field screening, and were evenly distributed along the pipe runs. The sampling locations are shown on Figure II-2-3.

The pipe run samples were collected in brass rings. The brass rings were pressed into the soil immediately beneath the bottom inverts of the piping, following piping removal. The pipe run samples were analyzed for the constituents listed under "Characterization of Degradation" in Table II-2-2. Laboratory analytical results are presented in Table II-2-5, and summarized below.

Mineral Spirits

Mineral spirits was the primary component of the material stored in the USTs. Mineral spirits was detected in six of the seven pipe run samples. The concentrations of mineral spirits ranged from non-detectable (<10.0 mg/kg) to 306 mg/kg in the vicinity of USTs piping.

Volatile Organic Compounds

Acetone and methylene chloride were the only volatile organic compounds detected in the pipe run soil samples. Acetone was detected in soil sample P-2 at a concentration of

Table II-2-5. Soil Quality Data, Pipe Run Samples, Partial Facility Closure, Safety-Kleen Corp. Service Center, Pekin, Illinois (August 28, 1991).

Sample Location and Depth	TCLP Metals (mg/L) Barium	Cadmium	Chromium	Lead	Volatile Organic Compounds (mg/kg)	Semi-Volatile Organic Compounds (mg/kg)	Mineral Spirits (mg/kg)
P-1	1.21	ND(0.001)	0.005	0.016	All ND	Isophorone 0.98 All others ND	306.1
P-2	1.33	ND(0.001)	0.005	0.014	Acetone 0.30 Methyl chloride 0.12B All others ND	Isophorone 0.74 All others ND	90.6
P-3	0.552	ND(0.001)	0.005	0.009	Methyl chloride 0.08B All others ND	Isophorone 0.83 All others ND	14.4
P-4	1.53	ND(0.001)	0.001	0.013	All ND	All ND	263.0
P-5	1.38	ND(0.001)	ND(0.001)	0.006	Methyl chloride 0.12B All others ND	All ND	ND(10.0)
P-6	1.57	ND(0.001)	0.001	0.013	Methyl chloride 0.09B All others ND	All ND	35.9
P-7	1.39	ND(0.001)	0.006	0.022	All ND	All ND	207.7

Notes:

1. TCLP indicates Toxicity Characteristic Leaching Procedure (40 CFR 261.24).
2. B indicates constituent detected in laboratory control sample or blank as well as in the sample.
3. Methylene chloride was detected in the laboratory control sample at concentrations ranging from 0.05 to 0.09 mg/kg.
4. ND indicates constituents not detected at a level above the PQL or detection limit in parentheses.

0.30 mg/kg. The laboratory data sheets indicate that methylene chloride was detected in samples P-2 (0.12 mg/kg), P-3 (0.08 mg/kg), P-5 (0.12 mg/kg), and P-6 (0.09 mg/kg).

S-K suspects that both acetone and methylene chloride may be laboratory introduced contaminants for the following reasons:

1. Both acetone and methylene chloride are chemicals commonly used in commercial laboratories;

2. The laboratory data sheets indicate that methylene chloride was detected in the laboratory blank/control samples at concentrations ranging from 0.05 to 0.09 mg/kg; and

3. Samples P-2, P-3, P-5, and P-6, which were reported to contain acetone and methylene chloride, contained non-detectable or relatively low concentrations of mineral spirits.

Based on this information, S-K does not believe that acetone and methylene chloride are facility-related.

Semi-Volatile Organic Compounds

Isophorone was the only SVOC detected in the pipe run soil samples. Low concentrations of isophorone were detected in samples P-1 (0.98 mg/kg), P-2 (0.74 mg/kg), and P-3 (0.83 mg/kg). These samples were all collected along the pipe run which extended north from northwest corner of the former UST vault.

Inorganic Constituents

The pipe run samples were analyzed for barium, cadmium, chromium and lead using the Toxicity Characteristic Leaching Procedure (TCLP; 40 CFR 261.24). Cadmium was not detected in the extract from any of the pipe run samples. Barium was detected in the extract from all of the samples at concentrations ranging from 0.55 mg/L in Sample P-3 to 1.57 mg/L in Sample P-6. The maximum concentration of extractable barium detected in Sample P-6 was less than the USEPA MCL (2.0 mg/L). In addition, the U.S. Geological Survey has documented elevated levels of naturally occurring barium in soils within the State of Illinois (Ref. Chemical Analyses of Soils and Other Surficial Materials of the United States, open File Report 81-197).

Chromium was detected in five of the seven pipe run samples and lead was detected in all of the pipe run samples using TCLP. Extractable chromium was detected in samples P-1, P-2, P-4, P-6, and P-7 at concentrations ranging from 0.001 mg/L to 0.006 mg/L. Extractable lead was detected in samples P-1 through P-7 at concentrations ranging from 0.006 mg/L to 0.022 mg/L. The extractable concentrations of chromium detected in the pipe run samples were less than the USEPA MCL of 0.1 mg/L. Extractable concentrations of lead in six of the seven pipe run samples were above the IEPA concentration level of 0.0075 mg/L.

CHAPTER II-3

GROUND-WATER CONDITIONS

There are no ground-water monitoring or production wells at the Pekin Service Center. However, there are considerable data on ground-water conditions in the vicinity of the Pekin Service Center. This information is presented below.

Ground-Water Occurrence

The Sankoty Sand is a highly permeable aquifer of large areal extent. The Wisconsinan outwash is hydraulically connected to the Sankoty Sand, which together constitute the main aquifer of the Havana Region. Neither unit appears to contain any low permeability silt or clay units which would act as hydraulic barriers (Walker *et al.*, 1965).

The Quaternary sediments near the Pekin Service Center are about 100 feet thick. The saturated thickness of the sediments is about 70 feet, as shown in Figure II-3-1 (Walker *et al.*, 1965). This information is confirmed by the onsite borehole in which ground water was encountered at a depth of 35 feet.

Walker *et al.* (1965) summarized the results of a pumping test conducted in a well (24N5W-9.8b1) located about 7,000 feet north of the Service Center. The well is 59 feet deep, with a 30-foot screen, and penetrated 31 feet of the aquifer. The test results indicate the transmissivity (T) of the aquifer is 330,000 gal/day, or 44,000 ft^2/day, and the hydraulic conductivity (K) is 10,000 gpd/ft^2 or 1,300 ft/day (Walker *et al.*, 1965). These values are representative of a clean sand to gravel aquifer (Freeze and Cherry, 1979).

Ground-Water Flow

The water table in the Havana Region is lowest in the fall and highest in the spring. As shown on Figure II-3-2, the seasonal ground-water elevation is closely tied to the Illinois River Stage. The high frequency weekly fluctuations in the ground-water elevation are caused by withdrawal of ground water during the work week followed by recharge during the weekend (Walker *et al.*, 1965).

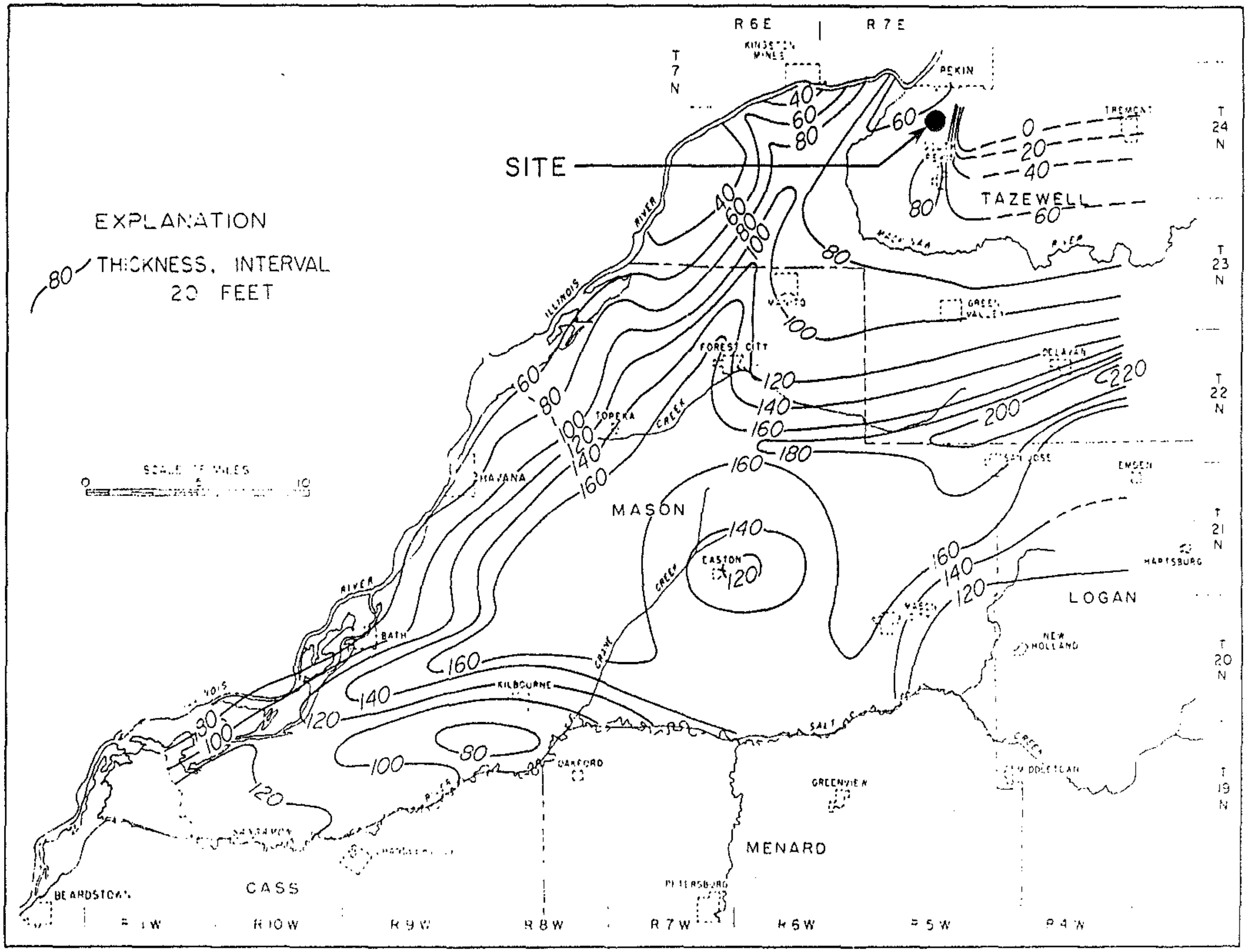

FIGURE II-3-1 :SATURATED THICKNESS OF UNCONSOLIDATED DEPOSITS, 1960
(from Walker *et al.*, 1965)

As shown on figures II-3-3 and II-3-4, ground water in the Havana Region and near the Service Center flows primarily to the west-northwest (Walker *et al.*, 1965 and Varljen and Shafer, 1993). However, insufficient data exist in the immediate site vicinity to determine the direction of ground-water flow from the facility. Ground water beneath the site could flow toward three potential receptors:

- To the southeast and into the Lost Creek alluvial channel, which discharges into the Illinois River channel;
- To the west-northwest and directly into the Illinois River channel; or
- To the west-northwest and into the area of influence of the Pekin municipal well field (Figure II-3-5).

Ground-Water Quality

Analysis of ground-water samples from wells completed in the Quaternary aquifer indicates the ground-water quality in the region is good. Analysis of a ground-water sample from a well (24N5W-9.8c2) at the Commonwealth Edison power plant, 7,500 feet northwest of the Service Center, indicates:

- The water is magnesium-calcium bicarbonate in character;
- Total dissolved solids (TDS) concentration was 307 parts per million (ppm);
- Hardness concentration was 271 ppm as $CaCO_3$; and
- Iron concentration was 0.1 ppm (Walker *et al.*, 1965).

Concentrations of all chemicals analyzed were below U.S. EPA secondary drinking water standards (U.S. EPA, 1992).

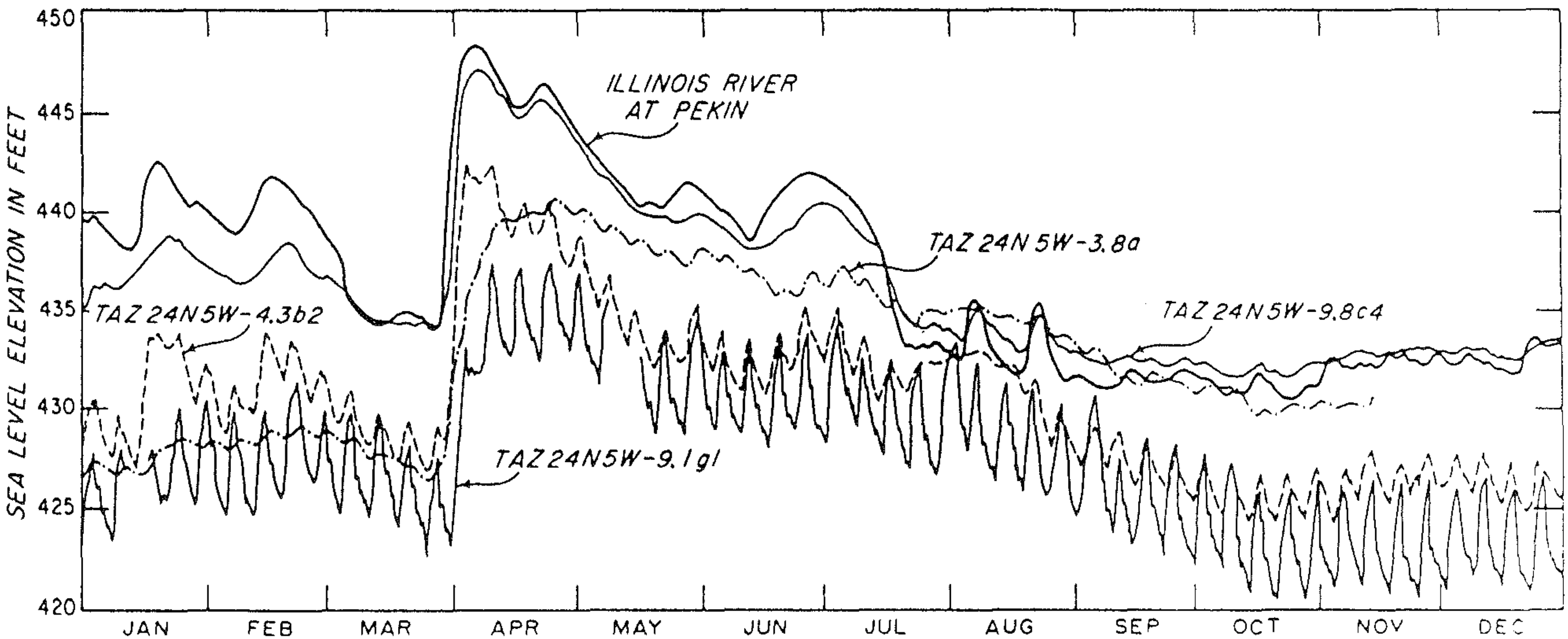

FIGURE II-3-2 :WATER LEVELS IN WELLS IN THE NORTHERN HAVANA REGION AND ILLINOIS RIVER STAGE, 1960 (from Walker *et al.*, 1965)

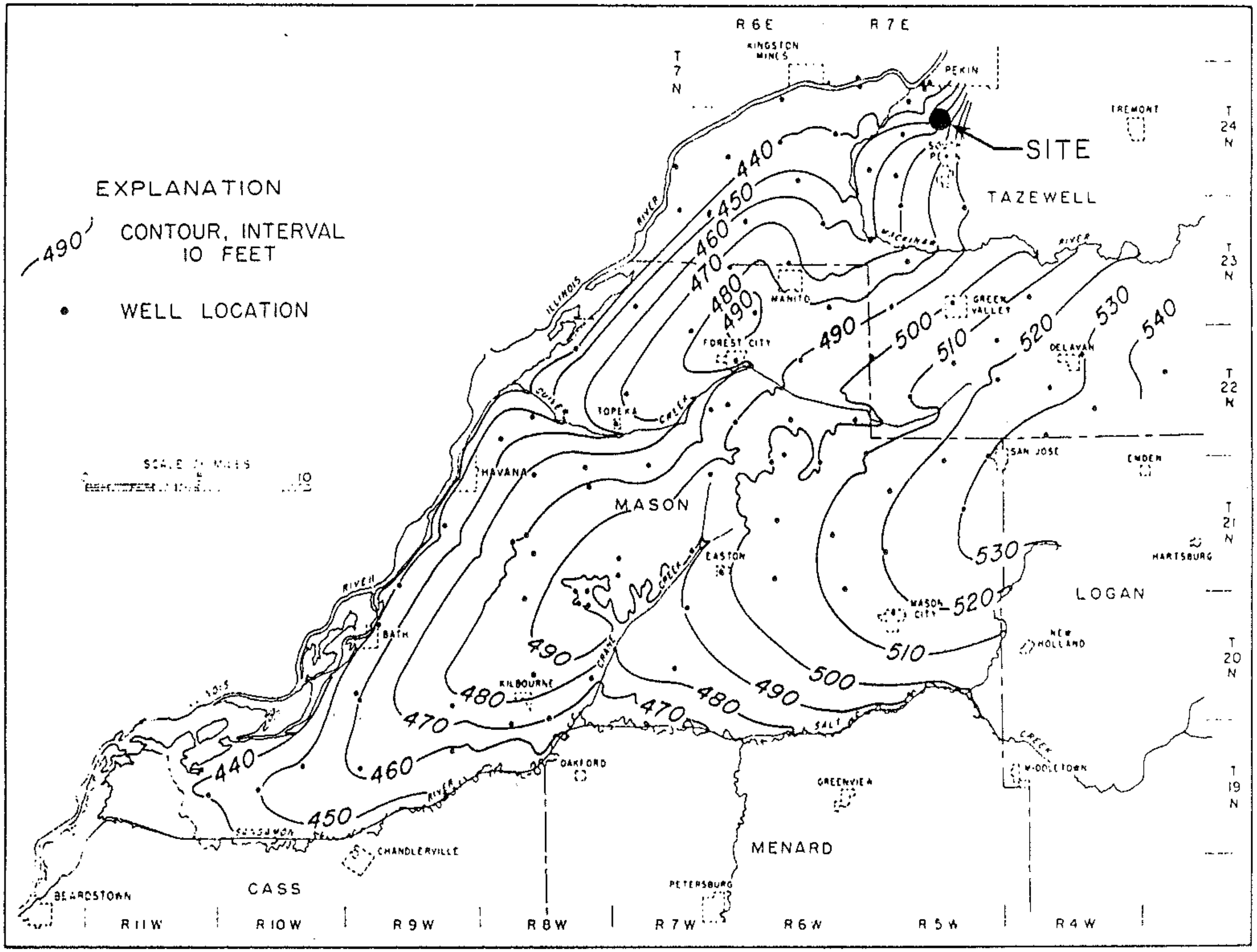

FIGURE II-3-3 :GROUND-WATER ELEVATION MAP OF THE HAVANA REGION, 1960
(from Walker *et al.*, 1965)

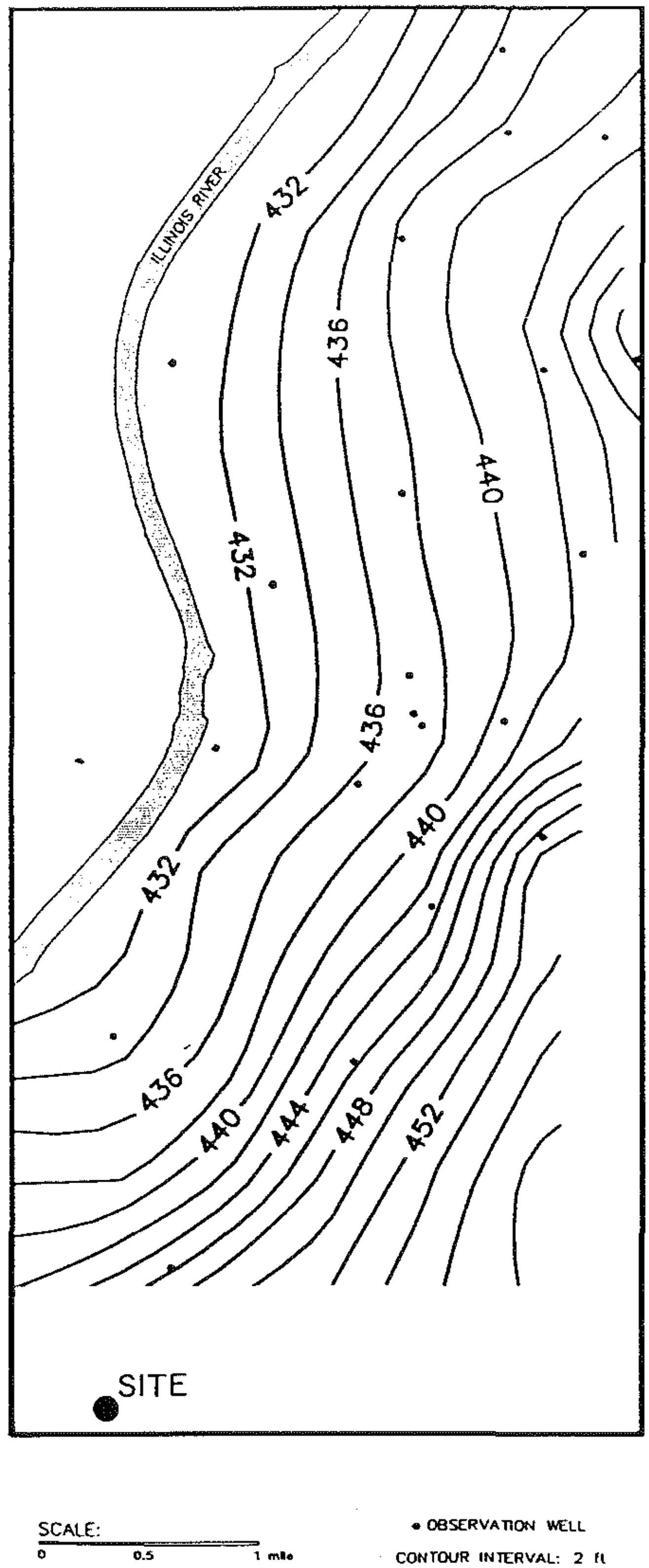

FIGURE II-3-4 :GROUND—WATER FLOW MAP, NOVEMBER 1991
(from Varljen and Shafer, 1993)

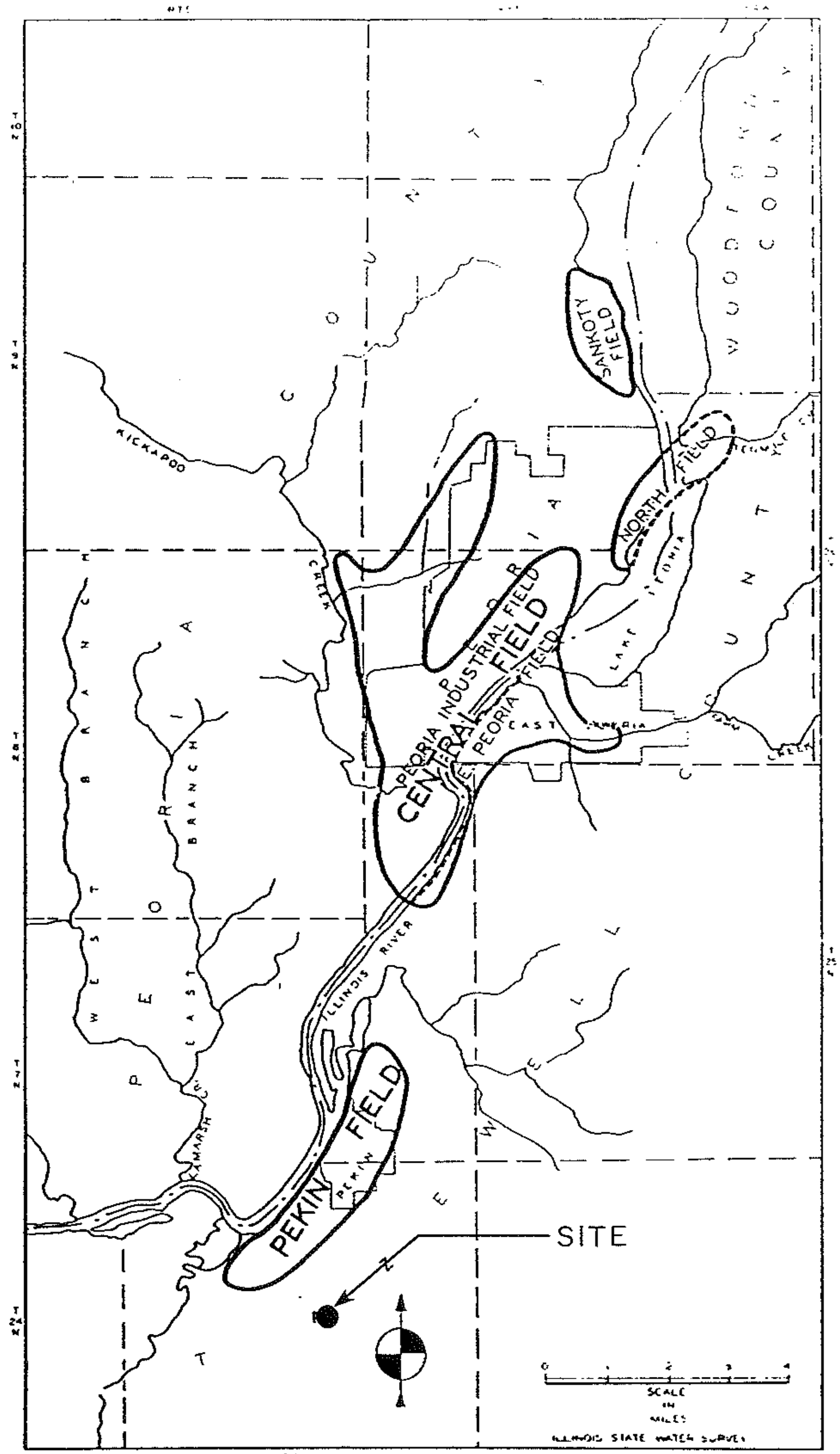

FIGURE II-3-5 :WELL FIELDS IN THE PEKIN–PEORIA AREA
(from Horberg *et al.*, 1950)

CHAPTER II-4

POTENTIAL MIGRATION PATHWAYS

Safety-Kleen Corp. (S-K) has evaluated potential migration pathways in order to design the RFI activities to be conducted during Phase I. The results of the evaluation are provided below.

Air

The potential for constituents to migrate from the solid waste management units (SWMUs) to air is minimal. The SWMUs in the warehouse are located inside, and impacted soils (if any) are covered by concrete. Therefore, wastes and impacted soils (if any) are not subject to wind erosion, and constituents cannot volatilize from impacted soils (if any) to air because of the concrete cover. In the rare case of a spill in the warehouse that drains to the trench, the material is immediately cleaned up before volatile compounds can migrate outside the warehouse. The RCRA Facility Assessment report concurs with this evaluation.

The shallow impacted soils at the past oil spill area were excavated and disposed at an offsite landfill. The area was backfilled with clean soils. Therefore, any impacted soils that remain are not subject to wind erosion. As shown by the soil gas survey (Figure II-2-2), which was conducted two years after the spill, total organic vapor concentrations in the shallow soils in the oil spill area are near or below detection limits. Therefore, there is no evidence of the potential for release of volatile compounds to air in the oil spill area.

Soils

Impacted soils at the SWMUs in the warehouse, if any, are covered by concrete. Therefore, there is minimal potential for ingestion or inhalation of impacted soils at the SWMUs in the warehouse.

Impacted soils at the oil spill area were excavated and disposed at an offsite landfill. The area was backfilled with clean soils. Therefore, there is minimal potential for ingestion or inhalation of impacted soils in the oil spill area.

Surface Water

The potential for constituents to migrate from the SWMUs to surface water is minimal. The two SWMUs in the warehouse are located inside, and thus not subject to stormwater runoff. Spills in the warehouse (if any) are controlled by a secondary containment system and cleaned up before they can spread outside the warehouse.

Impacted soils in the oil spill area were excavated, and the area was backfilled. Therefore, soils possibly still impacted by the oil spill would not come in contact with stormwater runoff.

The nearest surface waters are the Illinois River, Lost Creek, and a small pond, located 1.5, 0.25, and 0.25 miles away, respectively. The potential for constituents to move through ground water to these surface waters is low, as described in the next section.

Ground Water

There are no ground-water quality data collected at the Pekin Service Center. Two SWMUs are located inside a warehouse, and are constructed of concrete. Therefore, the potential for significant infiltration to cause constituents to migrate from the SWMUs through soils to ground water is minimal. The third area, where the oil spill occurred, is outside and subject to infiltration. However, the spilled oil contained principally heavier organic compounds which are less subject to migration. S-K will implement a ground-water quality investigation during Phase II of the RCRA Facility Investigation if the soil sampling program described in Part IV of this Workplan indicates that hazardous waste or hazardous constituents have migrated from the subject SWMUs and area of concern to ground water.

CHAPTER II-5

REFERENCES

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APPENDIX II-A

BOREHOLE LOGS

LOG-OF-BOREHOLE

PROJECT: Safety-Kleen/Pekin - UST Closure Assessment JOB# 390

LOC. OR COORDINATES: 6' NE of NE corner of tank battery MEASURING POINT ELEV.: NA GROUND ELEV.: NA TOTAL DEPTH: 19.5' BOREHOLE DIA.: 4" CASING DIA.: None	DATE: 7/25/91 DRILLER: Testing Service Corp. Greg Donavan Bob Prats RIG: Mobile Drill B-61 BIT(S): SSA FLUID: None	BOREHOLE: PRE-1 PAGE: 1 OF: 1 LOGGED BY: T. Nissen

DEPTH (FEET)	MATERIAL	BLOW COUNT/ 6 INCHES	DESCRIPTION AND COMMENTS
0-1.0	Sand/ Gravel		Sand and gravel, loose, dry.
1.0-3.0	Top Soil	5.5.7.7	Dark gray to black clay loam, firm, moist occasional iron mottling, slight blue tint, 15ppm, 6" retrieval.
3.5-5.5	Sand	4.4.5.5	Red-brown, fine to coarse grained, well sorted 3.5-4.5, poor sorting 4.5-5.5 moist, loose, 1 ppm, full retrieval, presume tank vault bedding.
5.5-7.5	Sand	3.3.3.1	Brown, medium to coarse grained, arkosic, loose, moist, 1 ppm, full retrieval.
7.5-9.5	Sand	3.5.7.9	Tan, abundant, pea gravel, arkosic, moist, 1 ppm. Full retrieval.
9.5-11.5	Sand	9.14.15.17	Same as above, 5 ppm, presume non-native soil.
11.5-13.5	Sand	11.17.14.15	Tan, medium to coarse-grained gravel, no pea gravel, loose, moist, faint, 6 ppm, presume native soil, lab sample collected.
13.5-15.5	Sand	9.10.12.14	Sand as above, 5 ppm.
15.5-17.5	Sand	11.12.14.14	As above, 6 ppm.
17.5-19.5	Sand	14.15.14.17	As above, minor pea gravel, 5 ppm, lab sample collected.
			TD = 19.5'

LOG-OF-BOREHOLE

PROJECT: Safety-Kleen/Pekin - UST Closure and Assessment JOB# 390

LOC. OR COORDINATES: East of former Return/Fill location MEASURING POINT ELEV.: NA GROUND ELEV.: NA TOTAL DEPTH: 15.0' BOREHOLE DIA.: 4" CASING DIA.: None	DATE: 7/25/91 DRILLER: Testing Service Corp. Greg Donavan Bob Prats RIG: Mobile Drill B-61 BIT(S): SSA FLUID: None	BOREHOLE: PRE-2 PAGE: 1 OF: 1 LOGGED BY: T. Nissen

DEPTH (FEET)	MATERIAL	BLOW COUNT/ 6 INCHES	DESCRIPTION AND COMMENTS
0-3.0	Top Soil	5.5.5.5	Upper 1.5 sand/gravel abrupt change to black silt loam, jet black oily material with fibrous material - paper-like, about 1/2" thick, 13 ppm, firm, moist, lab sample collected.
3.0-5.0	Sand	2.3.4.4	Red brown, fine grained, silty, minor clay @ 3.0-3.5 ft, sticky 3.0-3.5, loose 3.5-5.0, 11 ppm.
5.0-7.0	Sand	2.2.1.1	Red brown, homogeneous, fine-grained, loose, moist, clay ball @ 6.5 feet, 82 ppm.
7.0-9.0	Sand/ Gravel	9.11.15.18	Sand as above to 8 feet (fill), sandy gravel, pebbles up to 1" long (7-8 ft) tan, loose, moist, 6 ppm.
9.0-11.0	Sand/ Gravel	13.19.22.27	Sandy gravel as above, 6 ppm.
11.0-13.0	Sand/ Gravel	14.18.19.22	Sandy gravel, tan, as above, pebbles up to 1.5" long, 1 ppm.
13.0-15.0	Sand	11.14.19.23	Sand, medium to coarse grained, brown, homogeneous, arkosic, loose, moist, 3 ppm, lab sample collected.
			TD = 15.0'

LOG-OF-BOREHOLE

PROJECT: Safety-Kleen/Pekin - UST Closure and Assessment JOB# 390

LOC. OR COORDINATES: South of UST battery MEASURING POINT ELEV.: NA GROUND ELEV.: NA TOTAL DEPTH: 13.0' BOREHOLE DIA.: 4" CASING DIA.: None	DATE: 7/25/91 DRILLER: Testing Service Corp. Greg Donavan Bob Prats RIG: Mobile Drill B-61 BIT(S): SSA FLUID: None	BOREHOLE: PRE-3 PAGE: 1 OF: 1 LOGGED BY: T. Nissen

DEPTH (FEET)	MATERIAL	BLOW COUNT/ 6 INCHES	DESCRIPTION AND COMMENTS
0-0.3	Concrete		Concrete.
0.3-1.0	Sand/ Gravel		Tan sand and gravel.
1.0-3.0			Refusal on steel object - back up 6 feet and start over.
0-1.0			Same as above.
1.0-3.0	Sand		Brown medium gravel, few black blobs, loose moist, 542 ppm.
3.0-5.0			Refusal @ 4.5 feet, sampled for BFI 16 ox, move east 5 feet then move south 10 feet.
			Note: Total 5 times refusal; moved further south.
0-0.3	Concrete		
0.3-1.0	Sand		Brown sand.
1.0-3.0	Clay		Brown, silty clay loam, firm, moist, 0 ppm.
3.0-5.0	Clay		As above, 1 ppm.
5.0-7.0	Sand/Clay		5.0-6.3', red-brown sand, medium grained, loose, moist, 6.3-6.8', gray-brown fat clay; 6.8-7.0', sandy gravel, tan, loose, moist, 1 ppm.
7.0-9.0	Gravel		Pea gravel, very sandy, tan to brown, arkosic, loose, moist, 5 ppm.
9.0-11.0	Sand/ Gravel		Pea gravel as above, 9.0-10.0', clay ball @ 10.0'; 10.0-11.0', medium-coarse sand, brown, iron stained, very moist, 6 ppm, lab sample collected.
11.0-13.0	Sand		Brown, occasional iron staining, medium to coarse grained, homogeneous, arkosic, moist, 3 ppm, lab sample collected.
			TD = 13.0 ft.

LOG-OF-BOREHOLE

PROJECT: Safety-Kleen/Pekin - UST Closure and Assessment JOB# 390

LOC. OR COORDINATES: West of UST battery MEASURING POINT ELEV.: NA GROUND ELEV.: NA TOTAL DEPTH: 35.0' BOREHOLE DIA.: 4" CASING DIA.: None	DATE: 7/25/91 DRILLER: Testing Service Corp. Greg Donavan Bob Prats RIG: Mobile Drill B-61 BIT(S): SSA FLUID: None	BOREHOLE: PRE-4 PAGE: 1 OF: 2 LOGGED BY: T. Nissen

DEPTH (FEET)	MATERIAL	BLOW COUNT/ 6 INCHES	DESCRIPTION AND COMMENTS
0-0.3	Concrete		Concrete.
0.3-1.0	Sand		Gray, loose, moist.
1.0-3.0	Sand/Clay	3.4.4.5	1.0-1.7 sand, gray, medium grained, very moist, 1.7-2.5, fat clay, gray to black, firm to soft, moist; 2.5-3.0 sand, medium grained, very moist, 1271 ppm.
3.0-5.0	Sand/Clay	2.2.2.3	Sand and clay mixture as above, clay soft, gray and black with greenish hue, sand gray-green, oily appearance, 1822 ppm, full sample for TCLP, RCRA characteristics and landfill, (3" spoon).
5.0-7.0	Sand/Clay	3.3.3.3	Sand and clay as above, clay black, occasional pea gravel, 1371 ppm.
7.0-9.0	Sand/Clay	3.5.7.8	Sand and clay interbedded as above, clay occasionally green, 679 ppm (3" spoon).
9.0-11.0	Sand	6.8.9.11	Tan, no staining, medium-coarse grained, homogeneous, arkosic, moist, oily appearance, loose, 251 ppm.
11.0-13.0	Sand	7.12.18.22	Tan, coarse grained, arkosic, homogeneous moderate to poor sorting, moist, loose, 686 ppm.
13.0-15.0	Sand	9.14.19.23	As above, 718 ppm.
15.0-17.0	Sand	12.14.15.18	As above, 698 ppm.
17.0-19.0	Sand	8.8.10.11	As above, 601 ppm.
19.0-21.0	Sand	6.8.10.10	As above, 673 ppm.
21.0-23.0	Sand		As above, grading slightly finer @ 22.5', 390 ppm.
23.0-25.0	Sand/	8.9.10.12	Sand as above abruptly changing @ 24.3 to "dirty" pea gravel, Gravel arkosic, deeply weathered clasts, mixture of metamorphics, sedimentary, and crystalline rock fragments, silty with some clay, 25 ppm.
25.0-27.0	Sand	--	Pebbly sand, smaller pebbles than pea gravel above, same lithology (mixture), poorly sorted, homogeneous, 15 ppm.
27.0-29.0	Sand	--	As above, grading @ 28.3' to medium grained, well sorted (clean) sand, light gray, arkosic (much quartz), nearing water table, material very moist and colder than above, 8 ppm.
29.0-31.0	Sand	--	As above.
31.0-33.0	Sand	--	Abrupt change @ 31.0' to fine-grained sand, light gray, well sorted, laminated, 34 ppm.

LOG-OF-BOREHOLE

PROJECT: Safety-Kleen/Pekin - UST Closure and Assessment JOB# 390

LOC. OR COORDINATES: West of UST battery MEASURING POINT ELEV.: NA GROUND ELEV.: NA TOTAL DEPTH: 35.0' BOREHOLE DIA.: 4" CASING DIA.: None	DATE: 7/25/91 DRILLER: Testing Service Corp. Greg Donavan Bob Prats RIG: Mobile Drill B-61 BIT(S): SSA FLUID: None	BOREHOLE: PRE-4 PAGE: 2 OF: 2 LOGGED BY: T. Nissen

DEPTH (FEET)	MATERIAL	BLOW COUNT/ 6 INCHES	DESCRIPTION AND COMMENTS
33.0-35.0	Sand	--	Sand as above to 34.7'; 34.7-35.0', sandy gravel with abundant clay, saturated 34.7-35.0', sticky where clay-rich, 49 ppm, lab sample collected. Note: Water @ 34.7 ft. Total depth drilled = 35.0'

LOG-OF-BOREHOLE

PROJECT: Safety-Kleen/Pekin - UST Closure and Assessment JOB# 390

LOC. OR COORDINATES: East of tank battery MEASURING POINT ELEV.: NA GROUND ELEV.: NA TOTAL DEPTH: 13.0' BOREHOLE DIA.: 4" CASING DIA.: None	DATE: 7/25/91 DRILLER: Testing Service Corp. Greg Donavan Bob Prats RIG: Mobile Drill B-61 BIT(S): SSA FLUID: None	BOREHOLE: PRE-5 PAGE: 1 OF: 1 LOGGED BY: T. Nissen

DEPTH (FEET)	MATERIAL	BLOW COUNT/ 6 INCHES	DESCRIPTION AND COMMENTS
0-0.3	Concrete		Concrete.
0.3-1.0	Sand		Brown sand.
1.0-3.0	Sand	5.5.5.4	Brown, medium to coarse grained, occasional pea gravel, loose, moist, 5 ppm.
3.0-5.0	Sand	2.1.1.2	As above, clay in bottom of spoon (approximately 2" thick), 6 ppm.
5.0-7.0	Sand	3.4.6.8	5.0-5.2, brown clay, wet @ top, soft, moist throughout rest; 5.2-6.5' sand as above, brown to dark brown, moist, loose; 6.5-7.0' gravelly sand, pebbles up to 1" long, occasional clay, moist, very slightly cohesive, arkosic, poor sorting, 3 ppm.
7.0-9.0	Gravel/ Sand	8.4.2.2	Brown granule gravel, no clay, loose, moist, variable lithology, grading to very coarse grained, iron-stained sand at 8.5 feet, 8ppm.
9.0-11.0	Sand	4.5.7.9	Brown, coarse to very coarse grained moist, loose, 3 ppm.
11.0-13.0	Sand	8.12.14.18	Brown, medium to coarse grained, homogeneous, loose, moist, 1 ppm, lab sample collected.
			TD = 13.0'

PART III

PROJECT: 823

PART III

PROJECT MANAGEMENT PLAN

RCRA FACILITY INVESTIGATION
PHASE I RELEASE ASSESSMENT WORKPLAN
PEKIN, ILLINOIS SERVICE CENTER

TriHydro Corporation

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Laramie, Wyoming 82070
(307) 745-7474
FAX: (307) 745-7729

PART III - PROJECT MANAGEMENT PLAN

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CHAPTER III-1

INTRODUCTION

Safety-Kleen Corp. (S-K) owns and operates a service center in Pekin, Illinois. The location of the center is shown on Figure III-1-1. The Pekin Service Center is used to collect and temporarily store spent mineral spirits, immersion cleaner, dry cleaner solvent, paint wastes and waste oil until the materials are shipped to a S-K recycle center for reclamation into products and fuels.

RFI Objective

The Pekin Service Center is permitted for final status to store temporarily RCRA hazardous wastes (ILD 093862811). As a condition of the RCRA permit, the Illinois Environmental Protection Agency (IEPA) requires S-K to conduct a RCRA Facility Investigation (RFI). The purpose of the RFI is to determine the nature and extent of releases of hazardous wastes and hazardous constituents from certain solid waste management units (SWMUs) or areas of concern (AOC) at the facility. The locations of the SWMUs under investigation are shown on Figure III-1-2.

In order to achieve the RFI objective, Illinois Environmental Protection Agency (IEPA) designed a three-phase process and incorporated it into the Part B Permit:

- Phase I - Release Assessment - Phase I is designed to provide information on the characteristics and integrity of each SWMU/AOC and to determine if a SWMU/AOC has released, is currently releasing, or has the potential to release hazardous waste and/or hazardous constituents to the soil or air.

- Phase II - Extent of Release Assessment - Phase II is designed to define the extent of releases (if any) to soil from the subject SWMUs/AOC.

- Phase III - Ground-Water Release Assessment - Phase III is designed to define the extent of releases to the ground water (if any) from SWMUs/AOC identified in Phase I or II to have potentially released hazardous waste or hazardous constituents to the ground water.

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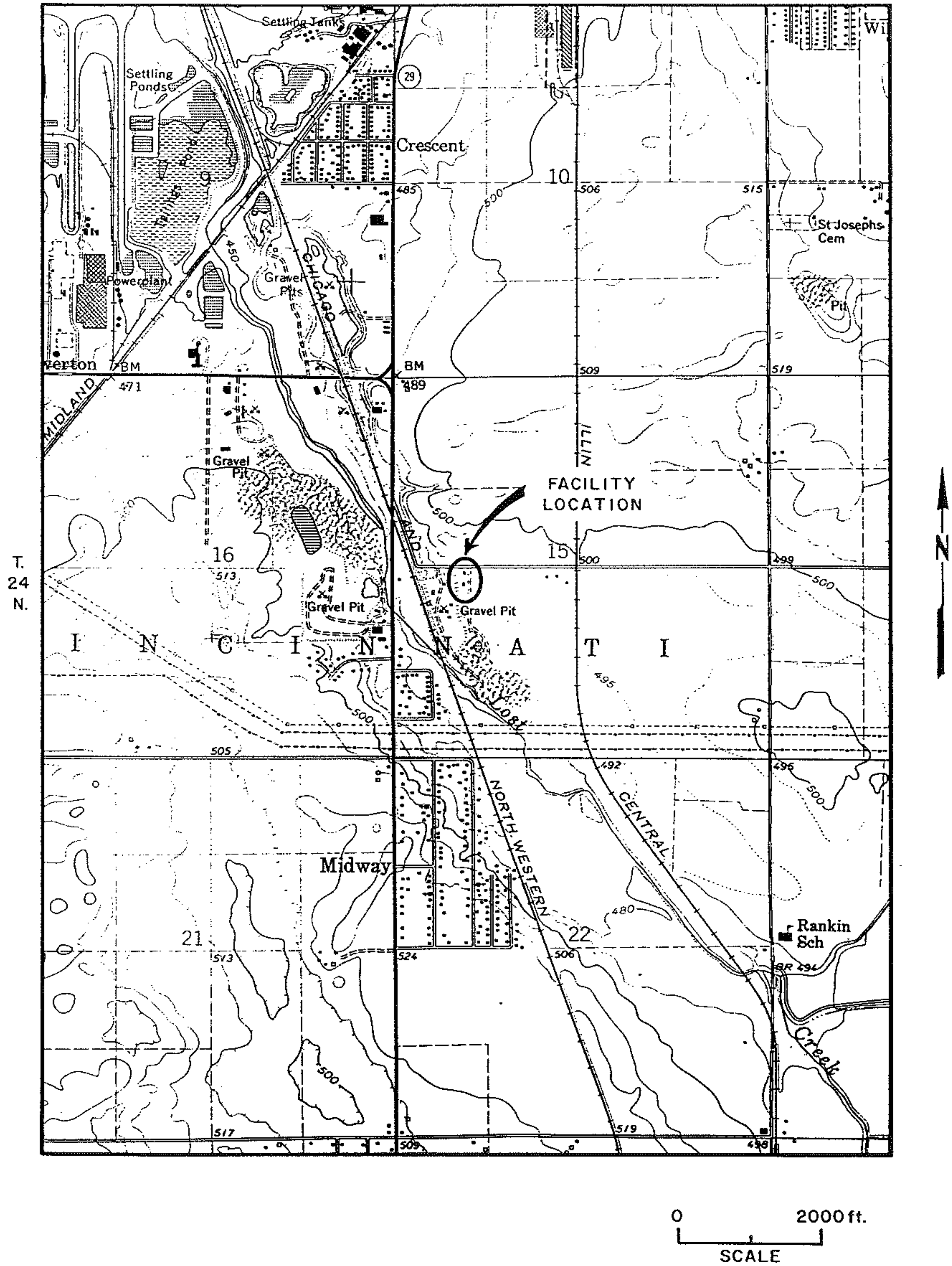

FIGURE III-1-1 : FACILITY LOCATION MAP, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

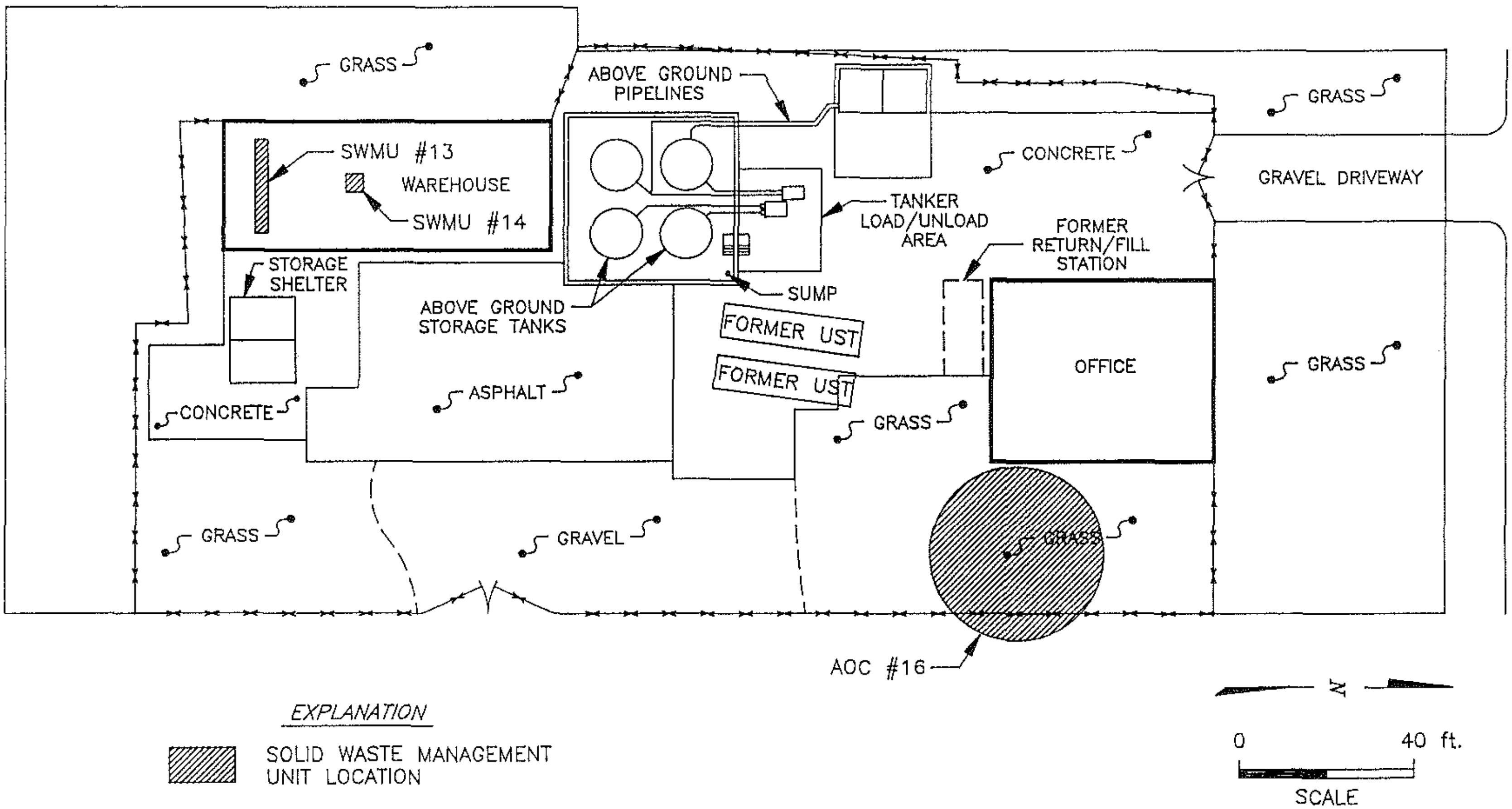

FIGURE III-1-2 :LOCATION MAP, SOLID WASTE MANAGEMENT UNITS (PHASE I), SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

SKPISMU2

RFI Phase I Workplan Organization

The Phase I investigation will be conducted in accordance with this Phase I Release Assessment Workplan. The content of the Workplan follows the IEPA guidance in Attachment E of the Part B Permit, entitled "Required Scope of Work for a RCRA Facility Investigation." Therefore, the Pekin Phase I release assessment is designed to be consistent with Phase I release assessments at other facilities in Illinois. The Workplan contains the following parts:

- General Facility Information (Part I), which presents general information about present facility operations, previous facility operations, SWMU and AOC descriptions, and regional information.

- Nature and Extent of Impacts (Part II), which describes previous information on soils and ground water and information on potential migration pathways.

- Project Management Plan (Part III), which presents the objectives of Phase I and the project organization necessary to achieve the objectives.

- Sampling and Analysis Plan (Part IV), which describes the procedures to determine the presence or absence of a release of hazardous waste or hazardous constituents from SWMUs/AOC to soil or air.

- Health and Safety Plan (Part V), which describes the procedures to protect the health and safety of those conducting field activities during Phase I.

- Data Management Plan (Part VI), which describes the techniques to document and track Phase I information, data, and conclusions.

- Quality Assurance/Quality Control Plan (Part VII), which details the procedures to ensure that information, data, and resulting conclusions are technically sound and properly documented.

CHAPTER III-2

PHASE I TECHNICAL APPROACH

The Phase I technical approach has been designed to achieve the Phase I objective and to be consistent with the IEPA guidance in Attachment E of the Part B Permit for the Pekin Service Center. The technical approach accommodates the physical and chemical conditions present at the facility, which are detailed in Parts I and II of this Workplan.

Time Schedule

The Sampling and Analysis Plan (SAP) in Part IV provides the procedures to generate the data necessary to achieve the Phase I objective. Sampling and analysis will be conducted according to the time schedule presented on Figure III-2-1. In order to achieve the Phase I objective, the specific goals of the SAP are to:

- Collect soil samples from those accessible locations and depths at the subject solid waste management units (SWMUs) or areas of concern (AOC) which are most likely to permit identification and proper characterization of a SWMU-related release of hazardous wastes or hazardous constituents, if a release has occurred.

- Analyze the soil samples for the SWMU-related or AOC-related hazardous constituents which permit the identification, characterization, and hazard evaluation of a release.

- Implement sampling and analysis procedures which promote the quality assurance goals of completeness, representativeness, comparability, accuracy, and precision.

Soil Sampling Locations

Soil sampling locations have been selected to provide the best evaluation of worst-case conditions caused by a release of hazardous wastes or hazardous constituents. Soil sampling will take place in areas of known releases, in areas where

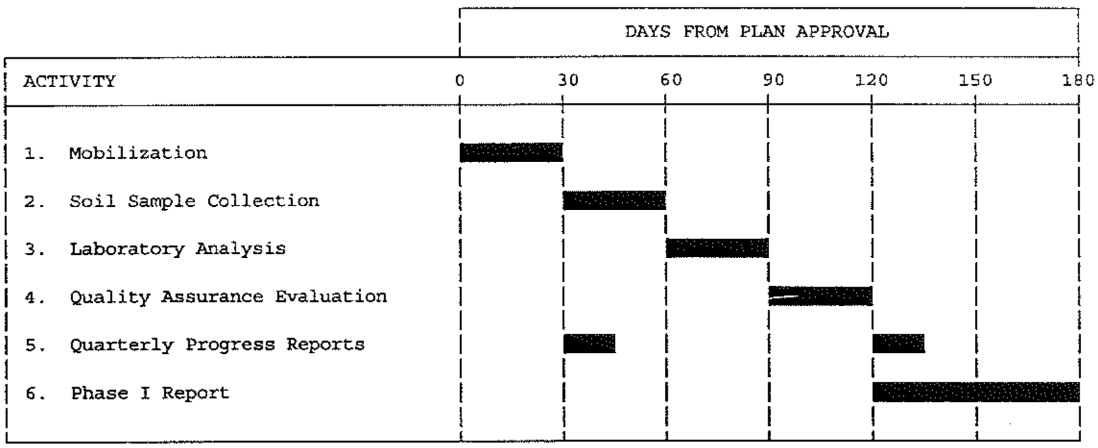

FIGURE III-2-1: TIME SCHEDULE, PHASE I RELEASE ASSESSMENT, PEKIN, ILLINOIS SERVICE CENTER soils are stained, and in areas where experience from similar sites indicate releases are most likely to occur.

Background Locations

Soils not influenced by releases from SWMUs/AOC and other industrial activities will naturally contain certain hazardous constituents such as metals. Data from background locations will be critical to identify the presence of elevated concentrations of metals (and perhaps other constituents) in soils due to a release. Background soil samples will be collected from the unsaturated zone from soils of similar texture to those underlying the SWMUs/AOC. Samples from background locations will also be used as field blanks to evaluate compliance with quality assurance objectives. Quality assurance procedures are described in Part VII of the Workplan.

The background sampling locations are shown on Figure III-2-2. The four background locations will satisfy the following criteria:

1. Located on Pekin facility property to minimize uncertainties about prior uses in the background areas.

2. Located at least 50 feet from any SWMUs/AOC listed in the Part B Permit.

3. Located at least 50 feet from any industrial activity.

4. Spatial distribution across facility.

5. Same soil texture as encountered in SWMU/AOC soil samples (because natural metals concentrations are a function in part of soil texture).

Background locations will be sampled first to minimize the potential for cross-contamination. If the onsite geologist determines that background soil samples are of a different soil texture than SWMU/AOC soil samples, he/she will collect samples from other background locations in order to satisfy the five background selection criteria listed above.

SWMU/AOC Locations

Seven soil sampling sites have been located in the areas which are accessible and are most likely to be impacted by a release from the SWMUs or AOC. Sampling locations in the warehouse area trench and drain are shown on Figure III-2-3.

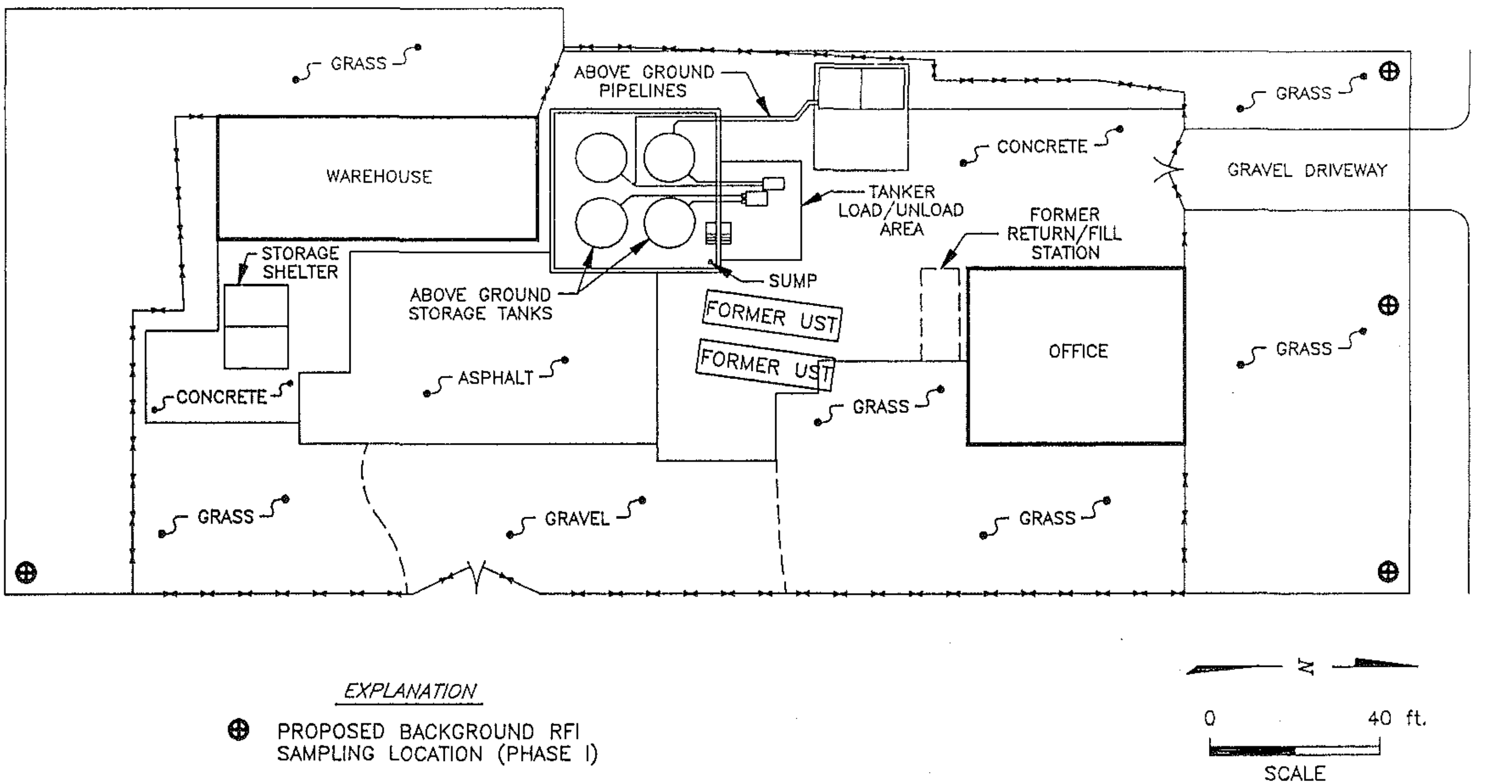

FIGURE III-2-2 :PROPOSED BACKGROUND RFI SAMPLING LOCATIONS, PHASE I RELEASE ASSESSMENT, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

SKPIP802

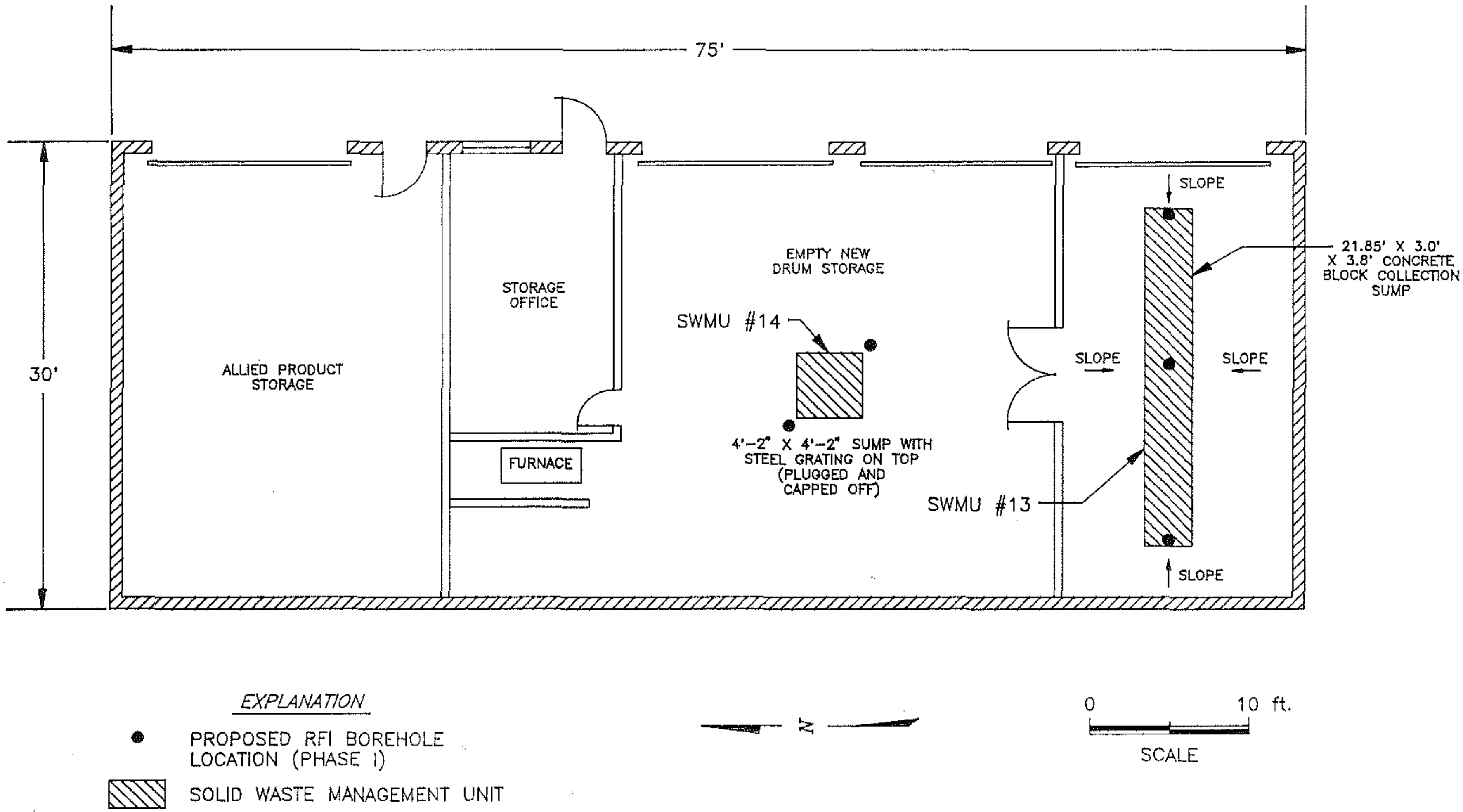

FIGURE III-2-3 :PROPOSED SAMPLING LOCATIONS, SWMU #13, SWMU #14, WAREHOUSE AREA TRENCH AND DRAIN, PHASE I RELEASE ASSESSMENT, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

SKPIPB03

The warehouse contains two SWMUs (SWMU #13 and SWMU #14) to be addressed during the Phase I Release Assessment. The locations are within the trench and near the drain. Note that the drain has been filled with concrete, and thus sampling locations are adjacent to the drain. The trench and drain are inside the warehouse. The five sampling locations are sited to ensure detection of a release of hazardous waste or hazardous constituents if one has occurred.

Sampling locations in the area of the previous oil spill (AOC #16) are shown on Figure III-2-4. This AOC is located approximately 50 feet east of the former underground storage tanks outside the fence and along the fenceline. The location of the oil spill has been confirmed by Roger Brotherton, who is the Pekin Service Center Branch Manager and was present to witness the spill location.

Sampling sites will be located on base maps of the Pekin facility, similar to those on figures III-2-3 and III-2-4. The project site manager will measure the location of each sampling site from existing structures and plot it on the base map. Distance measurements will be recorded in the field log book; a copy of the field notes will be included in the RFI Phase I Report.

Soil Sampling Depths

Soil sampling will occur in the unsaturated zone during the Phase I Release Assessment. Soil samples will be collected and analyzed by the laboratory from the interval of greatest impacts based on field screening methods described in Part IV. Soil samples will also be analyzed from a depth interval below the impacted zone, based on field screening, to determine the vertical extent of impacts.

Laboratory Analyses

The constituent list for the RCRA Phase I RFI is presented in Table III-2-1. The constituent list includes all hazardous constituents reasonably expected to be associated with parts cleaning/distribution centers. The constituent list has been developed based on hazardous constituents in the facility's Part B permit and on soil quality data obtained from previous assessment activities conducted at the Pekin facility.

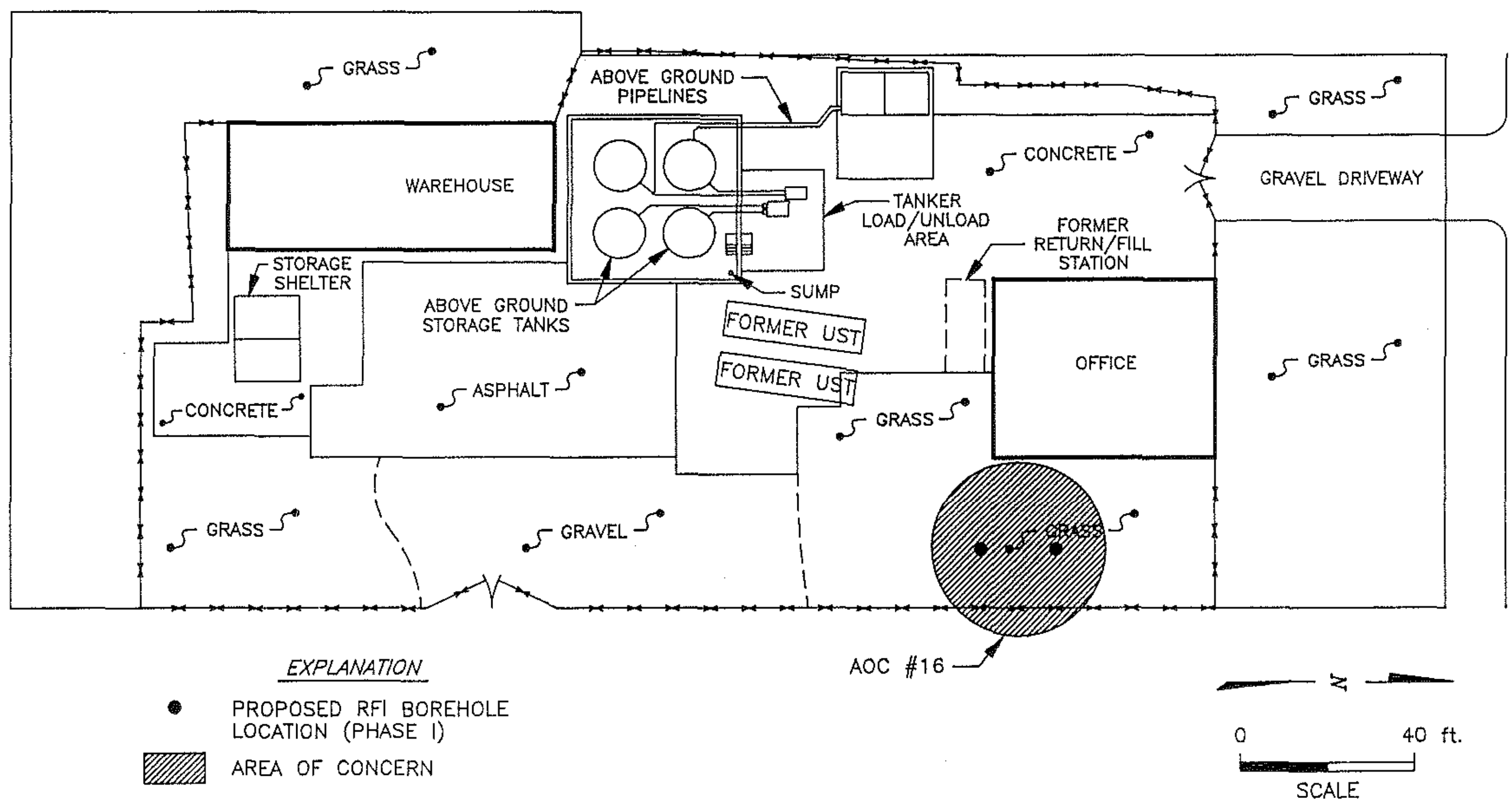

FIGURE III-2-4 :PROPOSED SAMPLING LOCATIONS, AOC #16, PAST OIL SPILL AREA, PHASE I RELEASE ASSESSMENT, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

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Table III-2-1. Constituent List, RFI Phase I Release Assessment, Pekin, Illinois Service Center.

Constituent	Method (from SW-846)	Method Detection Limit (mg/kg)
Inorganics		
Arsenic	7060	1.25
Barium	6010	2.0
Cadmium	6010	2.0
Chromium	6010	4.0
Lead	6010	11.0
Mercury	7471	0.04
Selenium	7740	0.9
Silver	6010	3.0
Organics*		
Volatile Organic Compounds (37)	8240	0.005-0.100
Semi-Volatile Organic Compounds (62)	8270	0.66-3.300

* A complete list of organic compounds and method detection limits for individual compounds are presented in Appendix IV-B of Part IV of this Workplan.

** Method Detection Limits may vary based on matrix effects per SW-846.

CHAPTER III-3

PHASE I REPORTING

Phase I includes a single, extensive soil sampling and analysis event. A report on this event, including all field observations, laboratory data, and quality assurance evaluations, will be submitted to the Illinois Environmental Protection Agency within 90 days of receipt of the complete set of soil quality data. The Phase I Report will provide a summary of the Phase I investigation, problems and responses, staffing changes, and a schedule of upcoming activities. The report will include conclusions on whether a release of hazardous wastes and/or hazardous constituents has occurred to soils or air, and whether the release has the potential to impact ground water.

Quarterly progress reports will be submitted to update IEPA on the progress of Phase I activities. Information included in the reports will be percentage of the project completed, activities completed during the reporting period, changes in the implementation of the Workplan, problems encountered during the reporting period, proposed corrections to these problems, projected work for the next reporting period, and any other pertinent information.

CHAPTER III-4

MANAGEMENT ORGANIZATION

Figure III-4-1 presents the proposed project management structure for the implementation of the RFI. The project will be directed by Mr. Robert Schoepke, Senior Project Manager - Remediation for Safety-Kleen Corp. (S-K). Mr. Schoepke has 10 years of experience in the environmental field and is responsible for cleanups and closures of S-K sites throughout the Midwest.

Mr. Schoepke will be assisted by Roger Brotherton, the Facility Branch Manager at the Pekin Service Center. Mr. Brotherton has five years of service center operation and management.

The IEPA Project Coordinator (Gregg Sanders) will ensure that the RFI project is conducted in accordance with the RCRA regulations and in general accordance with RFI guidance documents. The IEPA Project Coordinator will modify the RFI Workplan as needed, make site visits, and critically review the final report to ensure that the quality assurance objectives have been achieved. He will provide written guidance to S-K to correct any deficiencies which become evident.

The IEPA Project Coordinator and the S-K Project Director may conduct audits of field and laboratory activities.

S-K has developed an experienced project team in order to promote quality assurance during the RFI process. All team members have worked together on RFIs at other petroleum-contaminated sites. The principal team members are:

- <u>TriHydro Corporation</u> will function as the prime contractor. TriHydro will be responsible for the proper implementation of the Phase I Workplan, collecting soil samples and submitting them to the laboratory, auditing laboratory performance, and preparation of the RFI report. In addition to working with S-K at the Pekin site, TriHydro is conducting assessment and/or remediation projects at 40 other S-K sites throughout the central and western United States. A summary of TriHydro qualifications and resumes of personnel to be involved in the project are included in Appendix III-A.

- <u>Geo Corporation</u> will perform the drilling services. As described in Appendix III-B, Geo Corporation has the specialized equipment to enter and drill in the

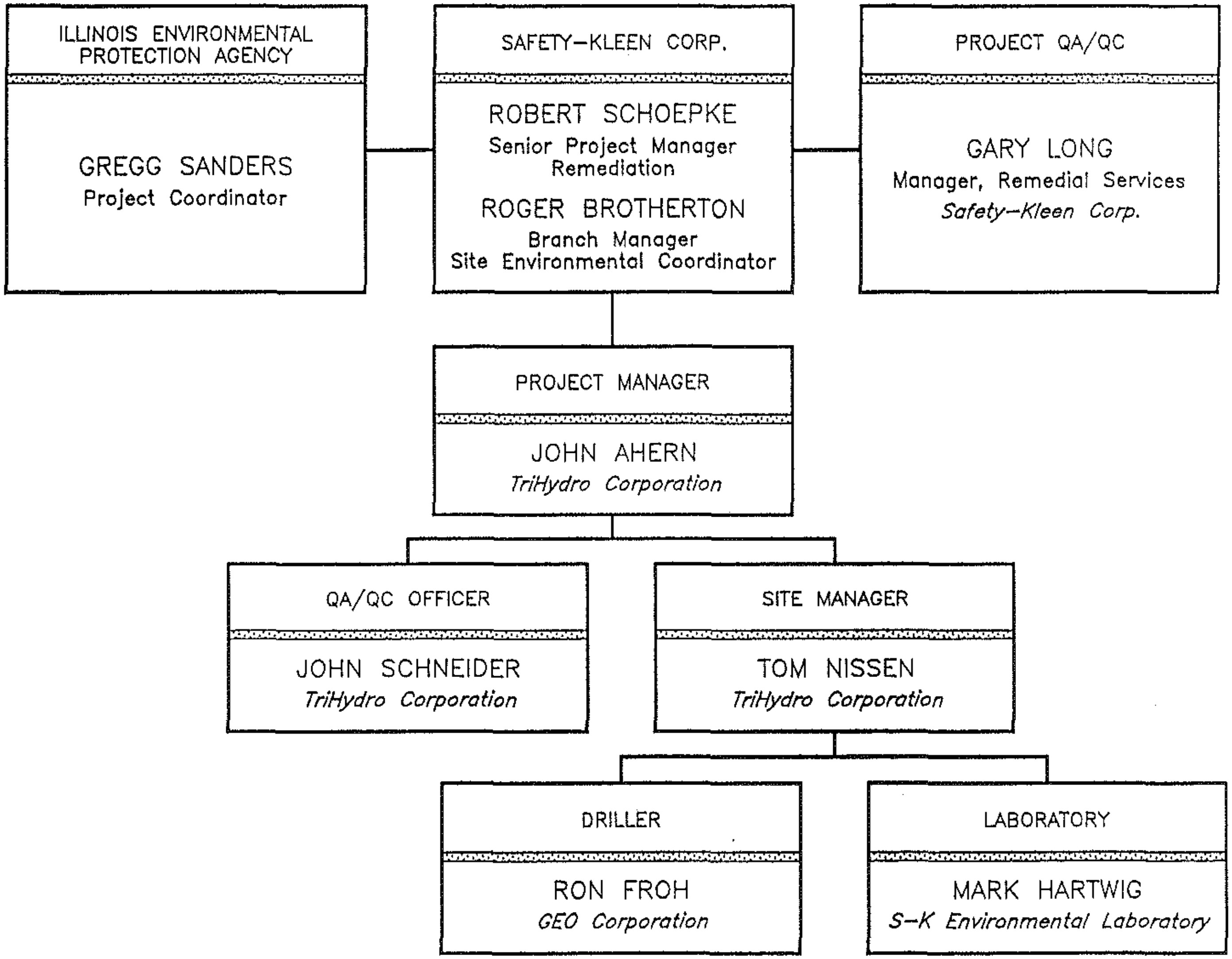


FIGURE III-4-1 :PROJECT MANAGEMENT TEAM, PHASE I RELEASE ASSESSMENT, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

SKPIMGNT

warehouse and has experience in drilling at petroleum-contaminated sites.

- S-K Environmental Laboratory will perform all laboratory analytical services. S-K Environmental Laboratory is performing the analytical services on many of S-K's monitoring, assessment, and remediation projects in the region. S-K Environmental Laboratory qualifications are summarized in Appendix III-C.

TriHydro Corporation

John Ahern, President of TriHydro Corporation, will be TriHydro's project manager for the RFI Phase I project. Mr. Ahern has 20 years of experience in assessment and remediation at petroleum-contaminated sites. He has served as project manager and/or QA/QC officer on 25 Safety-Kleen projects over the previous two years. Mr. Ahern is located at the TriHydro Corporation office in Laramie, Wyoming, and will provide all onsite project personnel from this office.

Activities to be performed by the Project Manager during the RFI include:

- Select, coordinate, and schedule staff for the work assignments.
- Control budgets and schedules.
- Prepare bimonthly progress reports.
- Monitor the subcontractor.
- Implement quality assurance measures and any corrective action requirements.
- Attend review meetings.
- Perform final data assessment.
- Supervise the preparation of the RFI report and provide technical peer review.

Under the direct supervision of the project manager is the QA/QC officer and the site manager. Mr. John Schneider will serve as the project QA/QC officer. The activities presented below will be completed by the project QA/QC officer:

- Audit field memoranda prepared by field personnel to assure that the procedures for sample collection and sample custody are strictly adhered to.
- Review laboratory reports to assure that adequate QA/QC procedures are imposed on the laboratory analytical results.
- Interface with IEPA's QA Officer and Project Manager, when necessary.
- Organize the final evidence file, and turn over the custody of this evidence file to S-K's Project Manager at the end of the project.

Mr. Tom Nissen will serve as the project's site manager. Mr. Nissen has six years of experience directing field activities for environmental assessment and remediation at RCRA facilities. Mr. Nissen will be responsible for all onsite activities including scheduling, direction of the subcontractors, and maintaining the sampling procedures in accordance with the Quality Assurance Project Plan (Part VII) and the Sampling and Analysis Plan (Part IV).

GEO Corporation

GEO Corporation will conduct the soil sample collection required during the RCRA Facility Investigation. Geo Corporation has custom designed equipment for field sampling and can match the field sampling equipment to the particular task, type of sample needed, and site conditions. During the Phase I investigation, a Scorpion Series ATV Hydraulic Probing Rig will most likely be used to allow access to the warehouse SWMUs. A detailed explanation of soil sample collection is described in the Sampling and Analysis Plan (Part IV).

S-K Environmental Laboratory

S-K Environmental Laboratory will conduct the laboratory services required during the RCRA Facility Investigation. The laboratory organization structure and internal responsibilities are described in detail in Appendix III-C.

CHAPTER III-5

COST ESTIMATE

The cost estimate for implementation of Phase I is presented in Table III-5-1. The estimate is organized per the field activities in the Sampling and Analysis Plan(Part IV) and reporting activities in the Project Management Plan (Part III). Safety-Kleen Corp. (S-K) has adequate resources to complete the Phase I release assessment.

S-K will submit financial assurance for completion of the Phase I release assessment in accordance with Paragraph IV.D.2 of the Part B Permit (Financial Assurance for Corrective Action). The documentation for financial assurance will be submitted by S-K within 60 days of approval of this Phase I Release Assessment Workplan by the Illinois Environmental Protection Agency.

Table III-5-1. Cost Estimate Worksheet, Phase I Release Assessment, Safety-Kleen Corp. Service Center, Pekin, Illinois.

Phase/Activity	Cost
I. Phase I Investigation	
Activity I.1 - Pre-Field Activities	$500
Activity I.2 - Sample Collection/Decontamination	6,200
Activity I.3 - Field Documentation/Chain-of-Custody Control	400
Activity I.4 - Post-Field Activities	300
Activity I.5 - Laboratory Analysis	11,500
	$18,900
II. Reporting	
Activity II.1 - QA/QC analysis per QAPjP	$90
Activity II.2 - Prepare Phase I Report	2,200
Activity II.3 - Prepare 2 quarterly progress reports	500
Activity II.4 - Compile data package and ship to facility	400
	$4,000
Cost Estimate Worksheet Summary	
1) Phase I Investigation	$18,900
2) Reporting	4,000
	$22,900

APPENDIX III-A

TRIHYDRO QUALIFICATIONS

Summary of Current TriHydro Clients

Client/Sites	Starting Date	Principal Services
Wyoming Department of Environmental Quality		
- Mountain View	1988	Contaminant source identification
- Laramie (Foster's Sinclair)	1990	Vapor and ground-water quality assessment, design and construction of trench to intercept vapors and hydrocarbon product
- Greybull	1992	Emergency response, design, and installation of residential vapor controls
Texaco Refining and Marketing, Inc.		
- Los Angeles Refinery (California)	1985	Hydrocarbon recovery, soil remediation, environmental assessment, regulatory reporting, ground-water monitoring
- El Dorado Refinery (Kansas)	1987	Hydrocarbon recovery, environmental assessment, air monitoring, vapor control, regulatory reporting
- Lockport Refinery (Illinois)	1985	Environmental assessment, regulatory reporting, NPDES evaluation, RCRA
- Bakersfield Refinery (California)	1992	Soil and ground-water quality remediation, environmental assessment
Golden West Refining Company		
- California Refinery	1985	Hydrocarbon recovery, environmental assessment, regulatory reporting, expert witness testimony, ground-water monitoring
Safety-Kleen Corp.		
- 40 sites (principally Midwest)	1988	RCRA closures, UST environmental assessments, regulatory reporting, soil remediation, ground-water remediation, RFIs
Sinclair Oil Corporation		
- Sinclair Refinery (Wyoming)	1985	Environmental assessment, ground-water monitoring, RCRA and State permitting, RFI, regulatory reporting
- Boise, Burley Terminals (Idaho)	1991	Environmental assessment
Miscellaneous Clients		
- Banner Associates (Wyoming)	1991	Municipal ground-water development
- Church and Dwight (Wyoming)	1991	Landfill permit, spill control plan at trona site
- D&B Services (Wyoming)	1992	Environmental assessment at oil field
- Enron (Colorado)	1991	UST environmental assessment
- First Interstate Bank	1992	Environmental audits

Summary of Current TriHydro Clients (continued)

Client/Sites	Starting Date	Principal Services
- Forsgren Associates (Wyoming)	1990	Municipal ground-water development
- Frontier Refining (Wyoming)	1991	Ground-water monitoring, RFI at petroleum refinery
- Holly Sugar Corporation (Wyoming, California, Montana)	1987	Ground-water assessment and monitoring, landfill permit
- Indian Refining Company (Illinois)	1985	RCRA closures, environmental assessments, waste management plans at petroleum refinery
- Koch Materials (Colorado, Kansas)	1991	Site assessments at asphalt plants
- Marathon Oil (Nebraska)	1992	Ground-water monitoring at oil/gas production site
- Shell Pipe Line Corp. (Wyoming)	1991	Assessment and remediation of crude oil spill
- Texaco Inc. (California)	1990	Expert witness testimony for tank farm
- Wheatland (Wyoming)	1987	Landfill permit and ground-water monitoring
- Wyoming Territorial Prison	1991	Ground-water monitoring

JOHN K. SCHNEIDER
CHEMIST

BACKGROUND

Mr. Schneider joined TriHydro Corporation in March of 1993. Prior to joining the firm, he worked at an analytical laboratory which conducted a variety of analyses on environmental samples.

Mr. Schneider's general resposibilities at TriHydro include working as a field technician, preparing reports for clients, and giving advice and support to co-workers on questions regarding laboratory analyses and other related subjects.

Fields of special competence include the analyses of semi-volatile and volatile organic compounds by Gas Chromatography/Mass Spectrometry(GC/MS).

EDUCATION

Colorado State University: B.S., Biology, Minor in Chemistry, 1991

PROFESSIONAL EXPERIENCE

3/93 - Present	TRIHYDRO CORPORATION Chemist Laramie, Wyoming
1/92 - 3/93	CENREF LABORATORIES Analytical Chemist Brighton, Colorado
1/91 - 5/91	WYOMING DIVISION OF CRIMINAL INVESTIGATION Analytical Chemist-Intern Cheyenne, Wyoming

PROFESSIONAL CERTIFICATIONS

Water Quality Monitoring Supervisor, Nebraska

EXPERIENCE

HYDROCARBON SPILL ASSESSMENT, RECOVERY AND REMEDIATION

Supervision of drilling crew, sampling of soil and water for laboratory analyses.

Collection and interpretation of ground-water quality and soil quality information for use in site characterization.

UNDERGROUND STORAGE TANK ASSESSMENT

Supervision of drilling crew, conduct sampling of soil and water around several active and inactive UST sites. Interpretation of ground-water and soil quality data for use in site characterization and compliance monitoring.

HAZARDOUS WASTE MANAGEMENT

Calculation of annual fugitive and stack emissions of a variety of compounds for a petroleum refinery, and subsequently filled out the Toxic Chemical Release Inventory Form R.

WATER QUALITY MONITORING

Statistical methods for analysis of water and soil quality.

Analytical methods for analysis of water and soil quality.

Quality assurance/Quality control over laboratory analytical work.

Supervision of ground-water monitoring programs.

THOMAS C. NISSEN, C.P.G.
GEOLOGIST

BACKGROUND

Mr. Nissen joined TriHydro Corporation in April 1987. Prior to joining TriHydro, Mr. Nissen completed his M.S. Geology degree and was employed by the Geological Survey of Wyoming. At the time of hire, Mr. Nissen was employed by the Wyoming Water Research Center and was enrolled in additional graduate-level courses at the University of Wyoming.

Mr. Nissen is a senior project manager with TriHydro. His responsibilities include development, administration, and general management of subsurface environmental investigations in a wide variety of hydrogeologic environments. Management responsibilities include project coordination, staffing, budget control, subcontracting, interpretation of Federal and State regulations, and negotiations and client liaison with regulatory agencies.

Mr. Nissen's areas of expertise include regulatory compliance permit and plan preparation, implementation, and reporting, including RCRA Closure, Post-Closure, Part B, RFI, and NPDES for hazardous and solid waste management units and underground storage tank (UST) facilities. Mr. Nissen has designed and supervised implementation of numerous ground-water quality monitoring and remediation programs with emphasis on economic, and Federal, State and local regulatory issues.

EDUCATION

University of Wyoming:	Supplemental coursework in Geohydrology, 1986-1987.
University of Wyoming:	M.S., Geology, 1985. Specialized in Geomorphology. Thesis titled, "Field and Laboratory Studies of Selected Periodicals Wedge Polygons in Southern Wyoming."
University of Wyoming:	B.S., Geology, 1981. Emphasis on physical and sedimentary geology.

PROFESSIONAL EXPERIENCE

4/87 - PRESENT	TRIHYDRO CORPORATION Geologist Laramie, Wyoming
1/87 - 4/87	WYOMING WATER RESEARCH CENTER Hydrologic Research Aide Laramie, Wyoming
6/86 - 10/86	GEOLOGICAL SURVEY OF WYOMING Geological Researcher I/Landslide Specialist Laramie, Wyoming
6/85 - 9/85	WYOMING STATE HIGHWAY DEPARTMENT Highway Engineering Geologist Cheyenne, Wyoming
1982 - 1984	UNIVERSITY OF WYOMING Teaching Assistant Laramie, Wyoming
1982 - 1983	WESTERN RESEARCH INSTITUTE Graduate Research Appointee Laramie, Wyoming
6/81 - 8/81	GULF MINERAL RESOURCE COMPANY Assistant Field Geologist Casper, Wyoming

PROFESSIONAL CERTIFICATIONS

Wyoming Board of Professional Geologists (PG-595)

American Institute of Professional Geologists (C.P.G. #8669)

OSHA Health and Safety Training for Hazardous Waste Operations and Emergency Response (maintained since 1988)

OSHA Hazardous Waste Operations Manager (maintained since 1988)

PROFESSIONAL AFFILIATIONS

National Water Well Association
National Ground Water Association
Society of Sigma XI
American Quaternary Association

EXPERIENCE

SPILL ASSESSMENT, RECOVERY AND REMEDIATION

Design and supervision of hydrocarbon recovery, soil, and ground-water assessment and remediation programs at petroleum refineries, UST sites, and above-ground storage tank sites, including planning, budgeting, and subcontracting. Job locations include California, Wyoming, Nebraska, Kansas, Illinois, and Indiana.

Installation of hydrocarbon recovery and ground-water extraction systems, including design and construction of wells, supervision on design and construction of fluid collection and transmission piping, fluid storage and power.

Spill extent of degradation investigations (soils and ground water).

Emergency response assessment of petroleum spills at above-ground storage tank facilities in Kansas.

Permitting of ground-water discharge with municipal and state agencies.

UNDERGROUND STORAGE TANK ASSESSMENT AND REMEDIATION

Design and implementation of Closure and Post-Closure Plans under RCRA and UST regulatory programs in Nebraska, Kansas, Iowa, Illinois and Wisconsin.

Design and implementation of UST subsurface assessments, sampling and analysis plans, and remediation programs (soils and ground water).

HAZARDOUS WASTE MANAGEMENT

Development and implementation of RCRA Closure Plans, Post Closure Plans, Park B Permit Applications, and Waste Analysis Plans for Hazardous Waste Management Units at petroleum refineries and UST facilities in California, Nebraska, Kansas, Iowa, Wisconsin, and Illinois.

Extent of degradation investigations.

Permitting for disposal of hazardous wastes.

Data collection and interpretation; report preparation.

Identification and quantification of hazardous wastes.

SOLID WASTE MANAGEMENT

Development and implementation of assessment and remediation plans for solid waste management units (SWMUs) and wastewater treatment units at petroleum refineries, UST facilities, industrial landfills, and sugar factories in California, Wyoming, Kansas, Iowa, Illinois, and Indiana.

Extent of degradation investigations.

Permitting for disposal of non-hazardous wastes.

Data collection and interpretation; report preparation.

WATER QUALITY MONITORING

Design and construction of ground-water monitoring wells at petroleum refineries, UST sites, and industrial landfills with emphasis on regulatory issues.

Collection and interpretation of ground-water quality data from petroleum refineries, UST sites, and other hazardous waste management facilities, industrial landfills, and petroleum spill sites.

GROUND-WATER DEVELOPMENT AND SUPPLY

Evaluation of municipal ground water supply alternatives throughout Wyoming under contract to the Wyoming Water Development Commission, including local/regional ground-water use, water rights impacts, and permitting issues, and hydrogeologic evaluation through literature search and photogeologic and field geologic mapping.

Exploration and drilling for large-production ground-water resources for municipal water supplies in Wyoming.

PROPERTY TRANSFER ENVIRONMENTAL AUDITS

Soil and ground-water quality assessments for land parcels considered for sale or lease at a shutdown oil refinery in Illinois.

Soil and ground-water quality assessments for a property in an industrialized property considered for purchase in California.

MINING

Hydrogeologic evaluation and characterization for restoration of abandoned open-pit uranium mine lands in Wyoming under abandoned mine lands (AML) programs.

EXPERT TESTIMONY

No current expert testimony experience.

OTHER

Geology

Photogeologic and diverse field geologic mapping.

Unconsolidated sediment sampling and laboratory analyses, including particle-size analysis, mineralogical analysis, and SEM analysis.

Collection and analysis of single-channel seismic refraction data for highway construction rippability assessments.

Wellsite supervision and borehole lithologic logging.

Geochemical sampling and reconnaissance for hard-rock uranium and other commodities in the Selkirk Mountains, Idaho and Washington.

Vadose Zone Investigations

Collection and interpretation of vadose zone monitoring data to define the nature and extent of contaminants in unsaturated soils at petroleum refineries, UST sites, and other hazardous waste management facilities, industrial landfills, and petroleum spill sites.

Geomorphology and Soil Science

Interpretation of surficial geologic processes

Paleogeographic and paleoclimatic reconstruction

Soil description, sample collection, and lab analysis

JOHN J. AHERN
PRINCIPAL

BACKGROUND

Mr. Ahern co-founded TriHydro Corporation in 1984. As a principal of the firm, his primary responsibilities include overall management of TriHydro Corporation, technical review, and regulatory compliance.

Mr. Ahern has over 19 years of experience in the environmental field. His areas of expertise include hydrocarbon spill assessment, recovery and remediation, hazardous waste management, water quality monitoring, ground-water development and supply, property transfer, environmental audits and expert testimony.

EDUCATION

University of Wisconsin:	M.S., Water Chemistry, 1976. "Impact and Management of Urban Stormwater Runoff."
University of Wisconsin:	M.S., Water Resources Management, 1975. Emphasis in Hydrogeology.
Amherst College:	B.A., Chemistry, 1971.

PROFESSIONAL EXPERIENCE

12/84 - Present	TRIHYDRO CORPORATION Water Quality Scientist Laramie, Wyoming
11/81 - 12/84	WESTERN WATER CONSULTANTS, INC. Water Quality Scientist Laramie, Wyoming
8/79 - 11/81	WYOMING WATER RESOURCES RESEARCH INSTITUTE Research Scientist Laramie, Wyoming
10/76 - 6/79	CH2M-HILL, INC. Environmental Scientist Denver, Colorado

10/75 - 6/76	WRIGHT-MCLAUGHLIN ENGINEERS Environmental Scientist Denver, Colorado
8/73 - 10/75	UNIVERSITY OF WISCONSIN Research Assistant Madison, Wisconsin
6/71 - 11/72	HICKOK AND ASSOCIATES Water Quality Lab Manager Wayzata, Minnesota

PROFESSIONAL AFFILIATIONS

National Water Well Association

EXPERIENCE

HYDROCARBON SPILL ASSESSMENT, RECOVERY, AND REMEDIATION

Assessment of spill migration and seepage loss tracer studies.

Recovery and recharge well maintenance during hydrocarbon recovery.

HAZARDOUS WASTE MANAGEMENT

Identification and quantification of hazardous waste.

Negotiations with regulatory agencies.

Design and supervision of water and soil sampling programs.

Preparation of closure plans and Part B permit applications.

WATER QUALITY MONITORING

Statistical methods for analysis of water quality data.

Quality control over laboratory analytical work.

Design and supervision of ground-water and surface-water monitoring programs.

Soil and ground-water quality clean-up at refineries and petroleum storage terminals.

Stormwater management studies for Denver, Anchorage, St. Louis, Madison, and eight cities in Illinois.

Technical and management advisor for a $4 million environmental impact statement in Milwaukee.

Principal investigator for research on water quantity-salinity conflicts in the Green River Basin, acid precipitation in Wyoming, and fisheries management in the Green River Basin.

GROUND-WATER DEVELOPMENT AND SUPPLY

Reservoir operations studies on the Little Bighorn River and Tongue River systems, Wyoming.

Water demand projections for Cheyenne, Wyoming.

Drill stem tests for quality and quantity estimates of possible municipal water supplies.

Ground-water resources studies in the Green River Basin, Wyoming.

PROPERTY TRANSFER, ENVIRONMENTAL AUDITS

Soils and ground-water evaluations at property conversion sites.

EXPERT TESTIMONY

Expert witness testimony for subsurface contamination.

JACK G. BEDESSEM, P.E.
CIVIL/ENVIRONMENTAL ENGINEER

BACKGROUND

Mr. Bedessem joined TriHydro Corporation in 1988. Prior to joining the firm, he was employed with the Wyoming Department of Environmental Quality Water Quality Division.

Mr. Bedessem's responsibilities at TriHydro Corporation include project management and engineering design of systems to assess and remediate soil and water quality degradation. Mr. Bedessem is also responsible for preparing and coordinating the preparation of hazardous waste facility, underground storage tank, and landfill closure plans, remedial action plans, RCRA facility investigation and correction action plans, and facility permits. In addition, he is responsible for supervising and coordinating the implementation of assessment, closure and remedial action programs.

Fields of competence include soil and ground-water engineering, water and wastewater engineering, site investigations, remedial design and implementation. Mr. Bedessem is familiar with Federal and State regulations concerning solid waste, hazardous waste (RCRA) underground storage tanks, water and wastewater.

EDUCATION

South Dakota State University:	Supplemental course work and research for advanced water, wastewater and environmental engineering, 1980 - 1982.
South Dakota State University:	B.S., Civil Engineering. Emphasis on water resources engineering, 1980.

PROFESSIONAL EXPERIENCE

8/88 - Present	TRIHYDRO CORPORATION Project Manager - Civil/Environmental Engineer, Laramie, Wyoming

10/83 - 7/88	WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY WATER QUALITY DIVISION Water Quality District Engineer/ Supervisor, Lander, Wyoming
6/82 - 9/83	WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY WATER QUALITY DIVISION Water Quality Engineering Evaluator, Lander, Wyoming
6/80 - 5/82	CITY OF BROOKINGS WASTEWATER TREATMENT FACILITY Wastewater Works Operator and Lab Technician, Brookings, South Dakota
6/80 - 5/82	SOUTH DAKOTA STATE UNIVERSITY Water Quality Research Assistant, Brookings, South Dakota

PROFESSIONAL CERTIFICATIONS

Professional Engineer #5372, Wyoming
Professional Engineer #27184, Colorado
Professional Engineer #11954, Kansas
Professional Engineer #E-7090, Nebraska

PROFESSIONAL AFFILIATIONS

National Water Well Association
American Society of Civil Engineers
National Council of Examiners for Engineering and Surveying

EXPERIENCE

SPILL ASSESSMENT, RECOVERY AND REMEDIATION

Management and engineering design (plans and specifications) of hydrocarbon recovery systems including interceptor wells and trenches, transmission and wastewater treatment systems. Management and engineering design (plans and specifications) of remediation systems including soil venting, vapor mitigation, bioremediation, land treatment, excavation/disposal and stabilization. Management and planning of site investigations for soil and water degradation due to hydrocarbons.

Coordination of site assessments, remedial actions and emergency response actions with regulatory agencies.

Management and implementation of programs for monitoring, operation and maintenance of remedial action systems.

UNDERGROUND STORAGE TANK ASSESSMENT AND REMEDIATION

Preparation of closure plans in accordance with RCRA and State regulations.

Management of removal, assessment and remediation projects for tank systems which contained petroleum products, hazardous waste (spend solvents) and waste oils.

HAZARDOUS WASTE MANAGEMENT

Management and planning of investigations to assess soil, surface water, ground-water and air at hazardous waste facilities. Assessment projects have included sampling and analysis of soil gas, soil, water and air. Management, engineering design and report preparation for remediation and closure of hazardous waste site including solvent recycling facilities, oils refineries, underground and above ground storage tanks, and container storage areas. Designs have included soil venting, ground-water extraction/ interception and treatment, excavation/disposal, stabilization, decontamination/decommissioning, vapor mitigation, and bioremediation. Technical evaluation of design, plans and specifications for construction of final hazardous waste landfill cover.

Technical evaluation of design, plans and specifications for wastewater treatment and disposal systems.

Development and evaluation of closure, decontamination and remedial action alternatives.

Management and preparation of project documents including plans, reports, specifications, operation/ maintenance manuals, health/safety plans and bid documents.

SOLID WASTE MANAGEMENT

Implementation and development of plans to manage industrial solid waste streams.

Technical and regulatory evaluation of landfill permit documents and closure plans.

WATER QUALITY MONITORING

Development and implementation of plans to monitor surface water and ground-water quality in accordance with State and Federal regulations.

Development and implementation of plans to asses the horizontal and vertical extent of ground-water quality degradation.

Evaluation and reporting of water quality data for design of monitoring and remedial action programs.

Management of routine ground-water monitoring programs at hazardous waste and underground storage tank sites. In accordance with State and Federal regulations.

GROUND-WATER DEVELOPMENT AND SUPPLY

Inspection and evaluation of public ground-water supply treatment and distribution systems.

Technical advisor for water system operators training committee.

Technical advisor for public works standard specifications development council.

Technical evaluation of design, plans and specifications for water treatment and distribution systems for compliance with State and Federal regulations.

PROPERTY TRANSFER ENVIRONMENTAL AUDITS

Management and development of plans to evaluate potential environmental impacts, site conditions and history. Management and implementation of Level I through Level 3 site assessment plans.

Preparation of reports including data evaluation, title searches, site descriptions, regulatory positions and recommendations.

MINING

Evaluation of ground water and surface water impacts due to tailings impoundment seepage.

Technical evaluation of seepage mitigation and remedial action measures.

Design and evaluation of sedimentation runoff control facilities at coal and trona mines.

Technical evaluation of drainage plans for mining and mine expansion permits.

EXPERT TESTIMONY

Expert testimony regarding management of wastewater discharges from an industrial facility. Testimony included discussion of site conditions, regulatory compliance and potential environmental impacts.

APPENDIX III-B

GEO CORPORATION QUALIFICATIONS

GEO
CORPORATION

CORPORATE
OFFICES

ROCKY MOUNTAIN REGION
400 Corporate Circle , Suite F
Golden, Colorado 80401
303-279-4655
1-800-872-6662

REGIONAL OFFICES

SOUTHWEST REGION
Houston, Texas
713-6682-6996
FAX # 713-682-6982

GREAT LAKES REGION
Detroit, Michigan
313-344-2110
313-344-1117

WESTERN REGION
Salt Lake City, Utah
801-566-4590

SOUTHEAST REGION
Atlanta, Georgia
404-425-2828
FAX # 404-425-4686

CENTRAL REGION
St. Loius, Missouri
314-890-0038

DISTRICT OFFICES

SOUTHWEST DISTRICT OFFICE
Baton Rouge, LA

SOUTHEAST DISTRICT OFFICE
Charlotte, NC

PROPOSED EXPANSION OFFICES:

SOUTHEAST DISTRICT OFFICE
Orlando, Florida

GREAT LAKES DISTRICT OFFICE
Chicago, Illinois

Field Sampling Equipment

GEO Environmental has custom designed its equipment for field samplin and analysis. GEO matches field sampling equipment to the needs of the client, the type of sample taken, and the terrain on the job site. The following is a list of the kind of equipment available.

Scorpion Series-ATV Hydraulic Probing Rig

* Weight: 1200 lbs
* Height: 8 feet
* Length: 89 inches
* Width: 43 inches

Sampling Capability

* Soil vapor to 30 feet.
* Soil sampling continuous or interval to 30 feet.
* Groundwater sampling - real-time/temporary monitoring to 30 ft.
* Expendable Aquifer Sampling Implant:
  EASI system/10-30 per day
* GEOpunch real-time bailed water samples to 30 feet
* 1", 3/4", 1/2" factory-slotted PVC, set to 30 feet
* Soil vapor sampling by passive and dynamic methods
* Soil vapor monitoring by temporary or permanent techniques

Viper Series - 1 Ton 4x4 hydraulic probing rig

* Vehicle: rig is mounted on 1 ton 4x4 Ford F-350 pickup bed
* Engine: V-8, 460
* Mast height: 9 feet

Sampling Capability

* Soil vapor to 60 feet.
* Soil sampling continuous or interval to 60 feet.
* Groundwater sampling - real-time/temporary monitoring to 30 ft.
* Expendable Aquifer Sampling Implant:
  EASI system/10-30 per day
* GEOpunch real-time ground-water samples using bailer.
* 1", 3/4", 1/2" factory-slotted PVC
* Soil vapor sampling by passive and dynamic methods
* Soil vapor monitoring by temporary or permanent techniques

Steam Cleaner

* For decontaminating probe rods and samplers
* Hotsy/Landa models
* Hot (up to 200° F) and cold rinse capable
* 2500 psi washing pressure
* 200 gallon water tank

GEO
CORPORATION

GEO ENVIRONMENTAL SOIL SAMPLING PROCEDURES

EQUIPMENT USED: -SCORPION ATV HYDRAULIC PROBING RIG
-VIPER 1 TON HYDRAULIC PROBING RIG
-ONE FOOT OR TWO FOOT KANSAS LARGE BORE SAMPLER
-TWO FOOT SPLIT SPOON PROBE SAMPLER
-HYDRAULIC PROBE RODS

PROCEDURES:

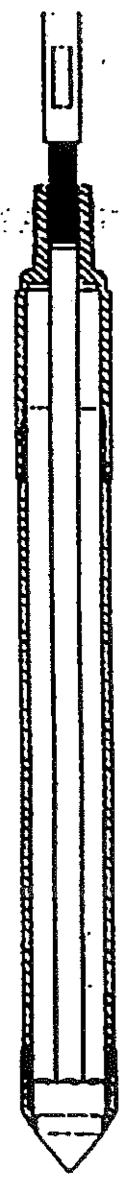
1. The entire borehole can be continuously cored or just interval cored by using either the large bore sampler or the split spoon sampler. The sampler is attached to one or three foot drive rods and driven to depth where it is opened.

2. The sampler is opened by using a special rod that is driven down the inside diameter of the probe rods. This rod turns a pin loose from the sampler releasing the piston drive head. The sampler is then filled by simply hammering it into the ground coring the soil into the body of the sampler.

3. The sampler is then brought to the surface where the soil is removed by either extruding a clear liner from the sampler or by breaking open the split spoon.

4. The equipment is then decontaminated by using a steam cleaner or an EPA triple rinse. Decontamination procedures are repeated before and after each sample is taken.

SOIL SAMPLER



GEO Environmental utilizes a Large Bore Sampler during soil sampling procedures. This apparatus is designed to recover sample cores a full 24 inches long X 1 inch in diameter. With its piston stop pin release mechanism, this sampler allows the technician to extract a highly representative sample from the bore hole. As standard practice, the sampler employs a polybutyrate liner which allows the sample to be removed with minimal effort and free of contamination.

** GEO Environmental will utilize, by prior arrangement, special liners composed of teflon, brass, or stainless steel.

APPENDIX III-C

S-K ENVIRONMENTAL LABORATORY QUALIFICATIONS

4.0 ORGANIZATION AND RESPONSIBILITY

It is the objective of Safety-Kleen Corp. to provide an organizational structure that can enhance the attainment of Corporate goals. Quality services, cost competitiveness, client satisfaction, employee gratification and profitable operations are primary Safety-Kleen goals.

4.1 DESCRIPTION OF LABORATORY PERSONNEL RESPONSIBILITIES

Safety-Kleen's Environmental Laboratory , located in Elk Grove Village, Illinois, is a full-service environmental analytical laboratory. A total staff of 26 people, consisting of laboratory personnel and/or support personnel managed by Mr. Mark A. Hartwig provide environmental services to industrial and internal clients. The Environmental Laboratory has state certifications for the analysis of soils, waste water and/or drinking water in Connecticut, California, Illinois, Kansas, New York and Wisconsin. Also, all those states that recognize any of the previous mentioned states in reciprocity. We are accredited by the American Association for Laboratory Accreditation (A2LA). This enables the Environmental Laboratory to conduct analyses for internal and client projects throughout much of the country.

4.1.1 PROJECT MANAGEMENT

Safety-Kleen's Environmental Laboratory uses a system of lab managers and project managers to plan, coordinate, execute and monitor project activities. Efficient and effective project management is of prime importance to the successful execution of project establishing and maintaining credibility and lasting value. Project management at Safety-Kleen is the coordinated and cooperative effort of a team, in which each member actively participates in successful project planning and execution. Project Managers are involved from the start in planning the project and time tables. When the client proposal is accepted by the client, the lab project manager will schedule with the client the arrangements for supplying sample containers and a schedule for sampling.

When samples are received at Safety-Kleen's Environmental Laboratory, the sample custodian will verify that all sample container seals are intact, and if so, will sign the chain-of-custody statement accordingly. In the event that it appears chain-of-custody has been broken, the sample custodian will immediately bring it to the attention of the Project Manager who will in turn contact the client for consultation and resolution. Written documentation of the event will be furnished.

The sample custodian will also verify information on the sample labels is the same as that appearing on the chain-of-custody. Any inconsistencies will also be brought to the attention of the Project Manager for immediate resolution with the client. The resolution will be documented in a memorandum to the project file and a copy provided to the client. After log-in, the samples are stored at 4°C in storage refrigerators until analysis.

The sample identification information and analyses requested are then logged into the laboratory computer and entered onto the laboratory backlog. The laboratory backlog serves as a guide to the Laboratory Manager, Group Leaders and Project Managers to identify the status of all samples in the laboratory, and is used to ensure that project deliverable requirements are met. The backlog contains the laboratory sample work order number, client name, number of samples received by matrix, number of samples to be analyzed for each requested parameter, due date, type of QC and report requested.

Backlogs are updated daily and reviewed by the Environmental Laboratory Project Manager and group leaders. The responsibility of the Project Manager is to monitor the status of samples using the backlog report, daily status meetings and through status updates from the Laboratory Manager. Use of the backlog allows the Project Manager to track the progress of samples through the various steps of the analytical process and assure timely completion of each task. If for any reason the backlog indicates that sample analyses are not completed within seven days of the due date, the Project Manager will work with the Laboratory Manager and Group Leaders to reassess laboratory priorities to enable timely delivery of the analytical report. The laboratory manager and group leaders have a commitment to maintain project schedules with a goal of 100% on-time delivery of quality data packages. If at any time, a delay in the required project turnaround time is anticipated, the Project Manager will immediately contact the client and inform them of the nature of the problem, the corrective action taken and a revised delivery date for the analytical data report.

A flexible capacity helps the laboratories meet project commitments. The Environmental Laboratory operates two shifts, 5 days per week in many of the service areas. The shifts are 8 hours shifts. Capacity is expanded by using autosamplers on many of the instruments. As demand for specific analytical requirements grows, the Environmental Laboratory has added equipment and full time staff as analytical backlog is identified.

4.1.3 KEY PERSONNEL

The Environmental Laboratory provides ongoing training to maintain the quality of its personnel. The highly trained staff of experienced professional chemists and technicians is the key element in the lab's credibility as a provider of quality environmental testing service. A strong base of experience, organized and managed effectively, results in a value added service product appreciated by our clients. The accompanying Skills Matrix of Key Personnel summarizes the education and experience of the laboratory personnel. The Laboratory personnel assigned to this project have an excellent record of satisfying project requirements. The Group Leaders provide guidance and direction enabling their staff to routinely provide quality test results.

Table 4-1 provides the skills matrix of key laboratory personnel.

Table 4 - 1

Skills Matrix of Key Personnel
SAFETY-KLEEN CORP.
February 14, 1994

	DEGREE	YRS LAB EXP	PROJ MNGT	QA/QC	DATA MNGT	CLP EXP	SW846 EXP	EPA 600 EXP	DOD EXP	A.F. IRP EXP	INDST HYG EXP
Laboratory Manager Mark Hartwig	BS Chem	20	X		X	X	X	X			X
VP Technical James Breece	Ph.D. Chem	31	X	X	X		X				
QA/QC Manager Dave Reese	BS Chem	15	X	X	X	X	X	X	X		
Inorganic Group Leader Rita Shah	BS Chem	11	X	X		X	X				X
Organic Group Leader Rick Cook	MS Chem	14	X	X	X	X	X	X			X
Project Manager Matt Schweik	BS Economics										
Chemist Pravin Patel	MS Chem	11		X			X				
Chemist Atul Shah	BS Chem	23				X	X	X			X
Chemist Mark Scheuer	MS Chem	8				X	X				X

RESUME

Atul Shah
GC/MS Chemist
TCLP/Environmental Laboratory

EDUCATION:

Bombay University
Bombay, India
B.S. Major - Chemistry
Minor - Botany

PROFESSIONAL AFFILIATIONS:

American Chemical Society

EMPLOYMENT HISTORY:

June 1991 - Present
Safety-Kleen Corp.
P.O. Box 92050
Elk Grove Village, IL 60009-2050

Position: GC/MS Chemist

Responsibilities:

1. Scheduling work for TCLP/VOA analysis.
2. Preventive maintenance on GC/MS, Tekmar & Data System.
3. Data Review/reporting.
4. Training to new operator/technicians.
5. PE/QC samples - data reporting.
6. Purchasing routine/new items.
7. Communicating to lab manager/group leader.
8. Learning new system/software (target).

March 1990 - May 1991
I.E.A. Illinois Inc.
Schaumburg, IL 60195

Responsibilities:

1. TCLP/VOCs analysis by using:
   a. EPA methods 8240/524.2/624
   b. H.P. GC/MSD with RTE-A System
   c. Tekmar's LSC 2000 and ALS 2016
2. Also familiar with BASE-NEUTRAL/ACID analysis by GC/MS.

1989 - March 1990

Responsibilities:

1. Working with Finnigan ITD 700 using EPA 524.2 method.
2. As a back-up Operator for INCOS 50.
3. Familiar with FORMASTER and HPs MSD.

1985 - 1988

Responsibilities:

1. Initiated, organized and established an efficient GC section for analysis of VOCs, PCBs, Pesticides, Herbicides, PAH, etc. by EPA methods.
2. Trained and supervised three technicians.
3. Automated the GCs operation by adding Autosamplers and a multitasking PC based software.
4. Troubleshooting and routine maintenance.
5. Familiar with industrial hygiene samples with NIOSH methods.

1983 - 1984

Responsibilities:

1. Metal digestion analysis. Trained for GC analysis.

1982

Responsibilities:

1. Wet chemical analysis.

1974 - 1982
S. Merck Chemical
Baroda, India

Position: Analytical Chemist

Responsibilities:

1. Wet chemical analysis of fine chemicals. Organic-inorganic acids, solvents, Vitamin C, etc.
2. Instruments used include: Karl Fisher, Flame Photometer, GC.

1973 - 1974
Themis Pharmaceuticals
Bombay, India

Position: R & D Chemist

Responsibilities:

1. Product Development of paracetamol, phenacetin, phenylbutazone, oxyphenyl butazone.

RESUME

Mark A. Hartwig
Manager
TCLP/Environmental Laboratory

EDUCATION:

Eastern Michigan University
Ypsilanti, Michigan
B.S. Major - Chemistry
Minor - Math, Business

PROFESSIONAL AFFILIATIONS:

American Chemical Society
American Society for Mass Spectrometry
MCM Local Mass Spectrometry Discussion Group

EMPLOYMENT HISTORY:

October 1991 - Present
Safety-Kleen Corp.
12555 W. Old Higgins Road
Elk Grove Village, IL 60007

Position: TCLP Manager

Responsibilities:

1. Manage operation of environmental laboratory.
2. Prepare annual business plans and operational budgets.
3. Develop staff and departmental functions.
4. Prioritize and monitor laboratory production to ensure timely completion of reports.
5. Ensure implementation of analytical testing capabilities.

December 1990 - April 1991
IEA, Inc.
126 West Center Court
Schaumburg, IL 60195

Position: Director of Operations - Illinois

Responsibilities:

1. P & L of laboratory.
2. Business development.
3. Ensure professional growth and development of staff.
4. Prepare and review capital equipment authorization for expenditure.

April 1991 - October 1991

IEA, Inc.
126 West Center Court
Schaumburg, IL 60195

Position: Director of Midwest Region Business Development

Responsibilities:

1. Develop and maintain high level business relationships with Fortune 500 accounts.
2. Prepare and deliver sales presentations to major accounts.
3. Development of new product and service offerings.
4. Strategic market review and assessment.

July 1988 - December 1990

York Laboratories of Chicago, Inc.
126 West Center Court
Schaumburg, IL 60195

Position: President and founder of York Laboratories of Chicago, Inc.

Responsibilities:

1. P & L of the Laboratory.
2. Strategic Marketing Decisions.
3. Ensure professional growth and development of staff.
4. Approve major capital expenditures.
5. Serve on York Laboratories Strategy Development Team.
6. Serve on YWC, Inc., Steering Committee.

August 1981 to July 1988

Hewlett-Packard Company
1200 East Diehl Road
Naperville, IL 60566

Position: Systems Engineer, GC/MS Product Line

Responsibilities:

1. Pre/Post Sales Support on all GC/MS instruments for MidWest Sales Region.
2. Provide technical consulting and applications support to Industrial and Governmental clients.
3. Assist in the development and testing of new hardware and software for all GC/MS systems.
4. Participate at trade shows and conferences by presenting technical papers and conducting technical workshops.

May 1974 to August 1981
Kemron Environmental Services
32740 Northwestern Highway
Farmington Hills, Michigan 48024

Position: Manager - Organics Analysis Laboratory

Responsibilities:
Coordinate and Execute the analysis of Industrial Hygiene and Environmental samples for organic contaminants by GC, IR, UV, GC/MS techniques.

AWARDS:

American Chemical Society Undergraduate Award in Analytical Chemical, 1973.

PUBLICATIONS:

"Use of Isooctyl Thioglycolate for the Separation of Tin and Antimony", Mark A. Hartwig, K. Rengan, J. Radioanalysis Chem. 42 (1978).

"Interfacing of an Hewlett Packard GC/MS with a HP-1000A Computer System to a Vax Computer and DEC Lims" Sunil Srivastava, Dennis Couch, Mark A. Hartwig, Scientific Computing and Automation Conference and Exposition (October 1988).

"Analysis to Phenols", Mark A. Hartwig, Hewlett-Packard Publication #23-5953-8056, (August 1982).

"Tuning the MSD to Meet DFTFF", Mark A. Hartwig, Hewlett Packard Publication AB85-12, (1985).

"Writing Procedure Files for the HP-1000 RTE VI GC/MS Data System", a Workshop, Mark A. Hartwig, Hewlett-Packard Company, ASMS Annual Conference, Cincinnati, Ohio (June 1986).

"Interpretation of Toxic Organic Data", Mark A. Hartwig, Annual Meeting-Academy of Certified Hazardous Materials Managers, July 1989.

"Running a Successful Environmental Laboratory", Mark A. Hartwig, Hewlett-Packard Seminar Series "ENVIRO-90", Cleveland, Cincinnati, St. Paul, Lansing, Michigan (November 1989).

"Productivity Gains through Quality Control", Mark A. Hartwig, HAZMAT-CENTRAL, Rosemont, Illinois (March 14, 1990).

RESUME

Rita Shah
Inorganic Group Leader
TCLP/Environmental Laboratory

EDUCATION:

University of Bombay
Bombay, India
B.S. in Chemistry and Biology

PROFESSIONAL AFFILIATIONS:

American Chemical Society

EMPLOYMENT HISTORY:

March 1991 - Present
Safety-Kleen Corp.
12555 W. Old Higgins Rd.
Elk Grove Village, IL 60009-2050

Position: Inorganic Group Leader

Responsibilities:
1. Supervise TCLP extraction and metals analysis area.
2. Troubleshoot difficult to handle filter wastes.
3. Train staff in sample prep and metals analysis.
4. Order and maintain supplies necessary for prep and metals analysis.
5. Maintain and troubleshoot ICAP and AA.

1987 - March 1991
Caremark Inc., Baxter
Buffalo Grove, IL

Position: Sr. Analytical Chemist

Responsibilities:
1. Performance of stability studies and collection and documentation of data.
2. Coordinator for various testing protocols for stability studies.
3. Responsible for methods development and assay troubleshooting.
4. Training and supervision of new personnel.

1982 - 1987
Chemical Waste Management
Riverdale, IL

Position: Analytical Chemist

Responsibilities:

1. Analysis of hazardous waste according to CLP protocol using ICP and AA.
2. Trained and supervised others in operation of ICP and AA. Familiar with QA/QC in the laboratory.

1976 - 1981
Haffkine Bio-Pharm
Bombay, India

Position: Quality Control Chemist

Responsibilities:

1. Performed analysis of raw materials, intermediates and packed products according to Pharmacopeia. Performed stability testing of packed products.

HONORS:

Published paper on interferences in graphite furnace at Pittsburgh Conference in March 1986.

PART IV

PROJECT: 823

PART IV

SAMPLING AND ANALYSIS PLAN

RCRA FACILITY INVESTIGATION
PHASE I RELEASE ASSESSMENT WORKPLAN
PEKIN, ILLINOIS SERVICE CENTER

TriHydro Corporation

920 Sheridan Street
Laramie, Wyoming 82070

(307) 745-7474
FAX: (307) 745-7729

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PART IV - SAMPLING AND ANALYSIS PLAN

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CHAPTER IV-1

SAMPLING LOCATIONS

The Sampling and Analysis Plan (SAP) provides the procedures to generate the data necessary to achieve the Phase I objectives. As stated in the Project Management Plan (Part III), the Phase I Release Assessment objectives for the Pekin facility are:

- To determine if a release of hazardous waste or hazardous constituents has occurred, is occurring, or could occur from solid waste management units (SWMUs) or areas of concern (AOC) at the Pekin, Illinois Service Center.

- If a release from a Pekin SWMU/AOC has occurred, to determine its degree of hazard, based on established corrective action limits.

Sampling and analysis will be conducted according to the time schedule presented on Figure IV-1-1. In order to achieve the Phase I objectives, the specific goals of the SAP are to:

- Collect soil samples from those accessible locations and depths which are most likely to permit identification and proper characterization of a SWMU-related or AOC-related release of hazardous wastes or hazardous constituents, if a release has occurred.

- Screen air in the warehouse trench to determine if a release of hazardous waste or hazardous constituents is occurring to air.

- Analyze the soil samples for the SWMU-related and AOC-related hazardous constituents which permit the identification, characterization, and hazard evaluation of a release.

- Implement sampling and analysis procedures which promote the quality assurance goals of completeness, representativeness, comparability, accuracy, and precision.

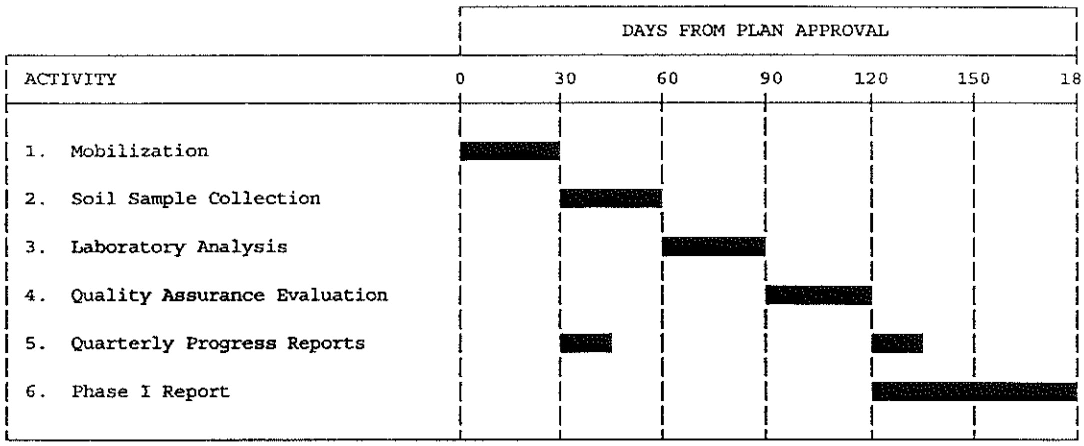

FIGURE IV-1-1: TIME SCHEDULE, PHASE I RELEASE ASSESSMENT, PEKIN, ILLINOIS SERVICE CENTER

Soil Sampling Locations

Soil sampling locations have been selected to provide the best evaluation of worst-case conditions caused by a release of hazardous wastes or hazardous constituents. Soil sampling will take place in areas of known releases, in areas where soils are stained, and in areas where experience from similar sites indicates releases are most likely to occur.

Background Locations

Soils not influenced by releases from SWMUs/AOC and other industrial activities will naturally contain certain hazardous constituents such as metals. Data from background locations will be critical to identify the presence of elevated concentrations of metals (and perhaps other constituents) in soils due to a release. Samples from background locations will also be used as field blanks to evaluate compliance with quality assurance objectives. Quality assurance procedures are described in Part VII of the Workplan.

The background sampling locations are shown on Figure IV-1-2. The four background locations have been selected to satisfy the following criteria:

1. Located on Pekin facility property to minimize uncertainties about prior uses in the background areas.

2. Located at least 50 feet from any SWMUs/AOC listed in the Part B Permit.

3. Located at least 50 feet from any industrial activity.

4. Spatial distribution across facility.

5. Same soil texture as encountered in SWMU/AOC soil samples (because natural metals concentrations are a function in part of soil texture).

Background locations will be sampled first to minimize the potential for cross-contamination. If the onsite geologist determines that background soil samples are of a different soil texture than SWMU/AOC soil samples, he/she will collect samples from other background locations in order to satisfy the five background selection criteria listed above.

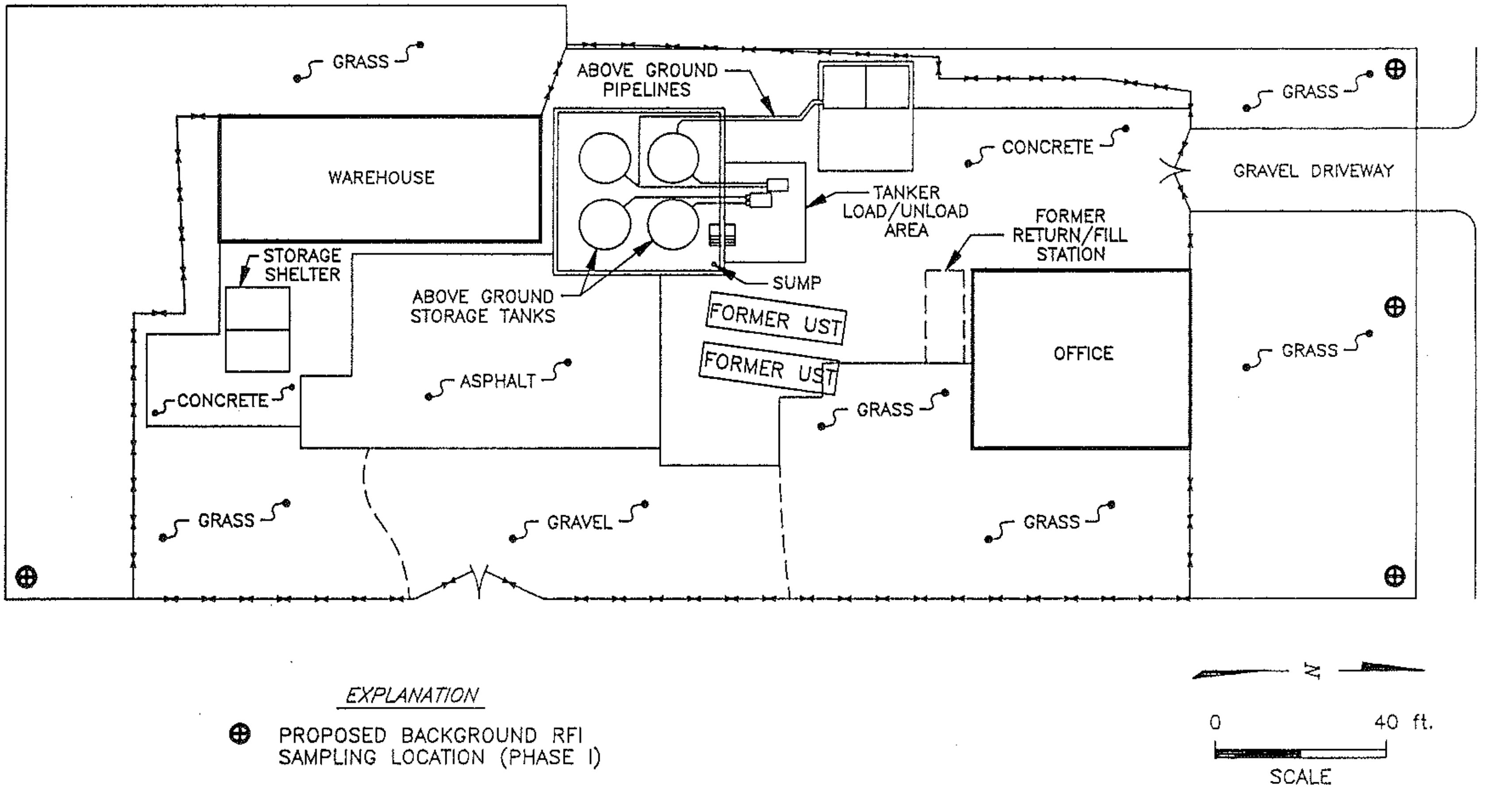

FIGURE IV-1-2 :PROPOSED BACKGROUND RFI SAMPLING LOCATIONS, PHASE I RELEASE ASSESSMENT, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

SKPIPB02

SWMU/AOC Locations

Seven soil sampling locations have been selected in the SWMU/AOC areas. Sampling locations in the warehouse area trench (SWMU #13) and drain (SWMU #14) are shown on Figure IV-1-3. The trench and drain are inside the warehouse. The five sampling locations are sited to give an accurate indication of a release of hazardous waste or hazardous constituents from these solid waste management units (SWMUs).

Sampling locations in the area of the past oil spill (AOC #16) are shown on Figure IV-1-4. This AOC is located 50 feet east of the former solvent tanks outside the fence and along the fenceline.

Sampling sites will be located on base maps of the Pekin facility, similar to those on figures IV-1-3 and IV-1-4. The project site manager will measure the location of each sampling site from existing structures and plot it on the base map. Distance measurements will be recorded in the field log book; a copy of the field notes will be included in the RFI Phase I Report.

Soil Sampling Depths

Soil sampling will occur in the unsaturated zone during the Phase I Release Assessment, in order to identify and characterize releases from Pekin facility SWMUs/AOC. As discussed in Part II, ground-water levels are approximately 35 feet below ground surface, but may vary depending on the Illinois River stage. The water level is typically lowest in the fall and highest in the spring. Because ground-water constituents can actually migrate above the current water table due to water table fluctuations and capillary action, soil sampling will be restricted to a maximum depth of 30 feet during Phase I, in order to avoid the influence of regional ground-water quality impacts (if any) on the soil quality measured during Phase I.

At the background locations, samples will be collected at approximately 5-foot intervals to 30 feet. During the sampling program, the onsite geologist will evaluate the range of soil textures from the background locations to ensure that they match the range of soil textures encountered in soil samples underlying the SWMUs/AOC. If they do not match, additional background intervals and/or locations may be sampled to ensure a match. The importance of matching soil textures is that inorganic concentrations are naturally a function of soil texture; clays tend to have higher inorganic concentrations than sands and gravels. Therefore, samples

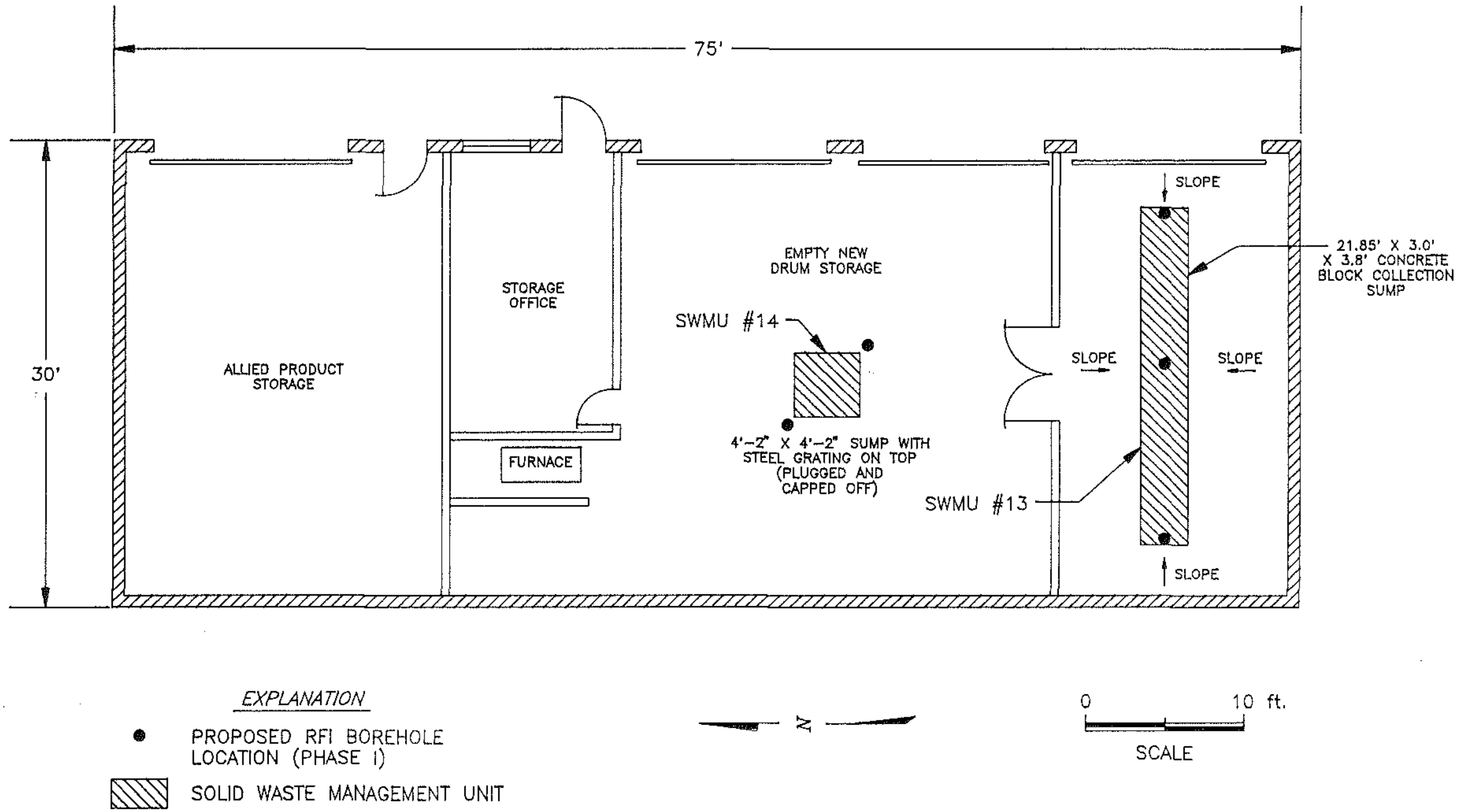

FIGURE IV-1-3 :PROPOSED SAMPLING LOCATIONS, SWMU #13, SWMU #14, WAREHOUSE AREA TRENCH AND DRAIN, PHASE I RELEASE ASSESSMENT, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

SKPIPB03

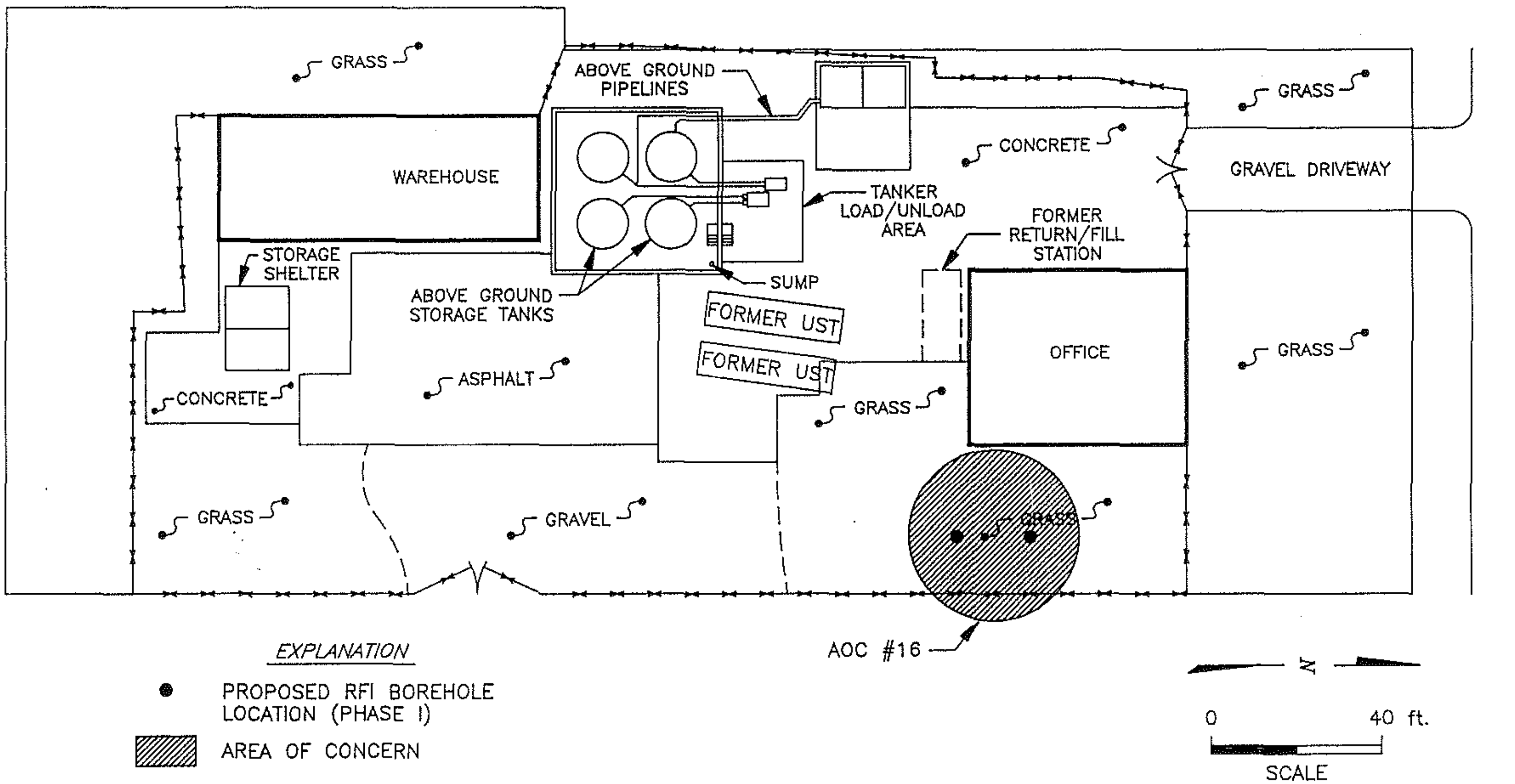

FIGURE IV-1-4 :PROPOSED SAMPLING LOCATIONS, AOC #16, PAST OIL SPILL AREA, PHASE I RELEASE ASSESSMENT, SAFETY-KLEEN CORP. SERVICE CENTER, PEKIN, ILLINOIS

SKPISMU4

from background locations should have the same soil textures as those from SWMU/AOC locations.

At the SWMU/AOC locations, soil samples will be collected continuously to 30 feet or to a depth where soils screen clean, whichever comes first. All soil samples will be screened in the field for impacts according to methods described in Chapter IV-2. Selected samples will be sent to the laboratory for chemical analysis. The selection criteria for samples to be submitted to the laboratory are also listed in Chapter IV-2.

CHAPTER IV-2

FIELD PROCEDURES

Safety-Kleen Corp. intends to collect four to eight background soil samples of each soil texture encountered, seven to 14 solid waste management unit (SWMU) or area of concern (AOC) soil samples, and two blind duplicate soil samples during the Phase I RFI Release Assessment. Procedures to collect the soil samples are described in this section. The field procedures include:

- Pre-field coordination and preparation activities
- Equipment decontamination
- Sample collection
- Field documentation
- Field screening
- Chain-of-custody control
- Post-field activities.

Pre-Field Activities

Several activities will be conducted prior to departure for the project site. A project team is assigned and the members will begin coordinating the sample collection event with the Pekin facility, the laboratory, and regulatory agencies. Field equipment will be checked and organized. Pertinent health and safety criteria will be reviewed along with the Health and Safety Plan (Part V). Site access will be checked with Roger Brotherton (Pekin facility site representative), and provisions will be made to pack the necessary equipment for delivery to the project site.

Project Team

The sampling project team will consist of the project manager, the site manager, and field team (if necessary). The qualifications and responsibilities of individual project team personnel with respect to the field activities are:

1. Project Manager

a. Schedule the sampling event;

b. Assign qualified personnel to the field team;

c. Monitor sampling activities to ensure compliance with the Workplan (calls from field personnel, etc.); and

d. Review field data and chain-of-custody/sample-analysis-request records to ensure compliance with the Workplan.

2. <u>Site Manager</u>

a. Knowledgeable in sampling techniques;

b. Knowledgeable in operation and maintenance of instruments;

c. Knowledgeable about project health and safety plan and procedures; and

d. Responsible for:

i. Ensuring compliance with the Workplan;

ii. Preparations for sampling event;

iii. Ensuring the proper equipment is available and operating;

iv. Assigning field team members' responsibilities and overall supervision (if necessary);

v. Onsite client contacts;

vi. Logging field data;

vii. Shipping or transporting samples;

viii. Chain-of-custody/sample-analysis-request forms; and

ix. Laboratory contact.

3. <u>Field Team Members</u>

a. Knowledgeable in sampling techniques;

b. Knowledgeable about the project health and safety plan;

c. Able to calibrate and operate instruments properly;

d. Log data acquired during sampling; and

e. Assist the sampling supervisor as necessary.

Preparation

The project site manager will review the RFI Phase I Workplan and related correspondence to determine if any plans or reports need to be brought to the site during monitoring, if any changes have been made to the sampling and analytical procedures, and if any groups need to be contacted about sampling observation or split sampling. At a minimum, the Illinois Environmental Protection Agency (Gregg Sanders), will be contacted seven to 14 days prior to sampling about the sampling schedule.

Pekin facility (Roger Brotherton or designate) will be contacted to confirm the expected arrival time at the site and expected departure time. The laboratory will be informed when sample coolers are expected to arrive and the method and location of arrival.

All sampling and monitoring equipment will be inspected prior to departure to ensure that it is in proper working order. The necessary health and safety monitoring equipment is described in detail in the Health and Safety Plan (Part V).

Equipment Inventory

The following equipment and supplies may be used for soil sampling:

- Soil Sampling
  - Concrete cutter or electric rotary hammer drill and bits
  - Brass rings, teflon sheets, and plastic caps
  - Glass jars (2 or 4 ounce and 32 ounce) with teflon-lined lids
  - Photoionization detector
  - Total recoverable petroleum hydrocarbon (TRPH) analyzer with associated equipment
  - Soil sample extruder

- Bentonite
- Asphalt and concrete patch
- Marking pen, labels
- Hexane
- Non-phosphate detergent and scrub brush
- Decontamination containers (detergent wash, rinse, rinse)
- Distilled or deionized water
- Protective gloves
- Plastic sheeting
- Coolers with ice
- Plastic bags for sample containers and ice

o <u>Health and Safety</u>

- Photoionization detector
- Combustible gas meter
- Benzene detector tubes
- Respirators with organic cartridges
- Dust protection masks

<u>Safety Procedures</u>

The project site manager will review the Health and Safety Plan (Part V), and make copies of the Plan available to all field team members. The project site manager will inform all field team members immediately before monitoring of the kinds of contaminants found or expected to be found at the site, and the possible hazards.

The project site manager will be responsible for bringing the appropriate safety equipment to the sampling site. All field team members will be knowledgeable in the operation of necessary safety equipment. Each field team member is responsible for 1) bringing appropriate safety equipment to each sampling site during monitoring, 2) making the equipment immediately available for use, 3) recognizing safety or health hazards, and 4) undertaking the appropriate safety precautions.

The field team will consist of a minimum of two people at or in the general vicinity of the sampling site. If a field team member will be out of visual contact with the other member(s) of the sampling party, he or she will inform the project site manager of his/her location before heading to the sampling site.

Access Control

Protective measures will be employed for limiting access to the sampling sites during sampling. The project site manager (or designate) will be present at each sampling site during the entire sampling period. The project site manager will be responsible for controlling any activities that might influence the integrity of the soil collection procedures.

Sample Collection Procedures

The project site manager will implement the monitoring required under the Health and Safety Plan (Part V of the Workplan). Concrete or asphalt will be removed (if appropriate), and soil sample collection will commence with GeoProbe or equivalent equipment using the following procedure:

1. A new or decontaminated brass liner will be placed into a stainless steel sampler (called a Kansas sampler). Samplers are 1 or 2 feet in length.

2. The sampler (decontaminated) will be attached to drive rods which are 3 feet in length.

3. The sampling tool will be hydraulically advanced to the sampling depth.

4. The tool will be opened and driven 1 to 2 feet to fill the liner with a soil sample.

5. The tool will be hydraulically withdrawn to the surface.

6. The brass liner will be broken manually into sections by a field team member wearing sterile gloves.

7. The uppermost section will be discarded, because it may contain borehole slough.

8. Two sections will be capped with Teflon sheets and slip-on plastic caps, marked with a sample number, and placed in an opaque cooler on ice immediately upon collection. Care will be taken to minimize headspace during this procedure. Sample collection will adhere to IEPA "Soil Volatile Sampling Procedures" (Appendix IV-A), except that Teflon sheeting rather than aluminum foil will be used to seal the brass rings.

8. The soil in the remaining section will be subjected to field screening procedures described in a subsequent section.

One soil sample, consisting of four brass rings (or more, if necessary), or three 2- or 4-ounce glass jars if soil lacks sufficient cohesion, will be collected from each sampling interval. In addition, blind duplicate samples will be collected from two of the SWMU/AOC sites for quality assurance analyses. The brass rings or two 4-ounce glass jars will be used for analysis of volatile organic compounds, semi-volatile organic compounds, and eight metals.

Two brass rings or two glass jars will be immediately stored on ice (or equivalent) for transport to the laboratory. No preservatives will be added to the soil sample containers. Coolers will be delivered or shipped to the laboratory within 24 hours of sample collection.

Soil and concrete will be stockpiled with other demolition debris from the facility, and hauled to a suitable offsite disposal facility. Sampling locations will be plugged by pouring bentonite crumbles down the hole and hydrated in approximately 1- to 2-foot lifts to the surface. The surface will be repaired to matching grade. A concrete patch will be placed over the sampling location in areas where concrete is present and asphalt patch will be placed over the sampling location in areas where asphalt is present.

Field Screening

One aliquot of soil from each sampling interval will be screened in the field to evaluate the nature and degree of impact. Field screening includes physical descriptions, measurement of total organic vapors (TOV) with the photoionization detector, and measurement of total recoverable petroleum hydrocarbons (TRPH) with a TRPH analyzer.

One subaliquot of soil from each sampling depth will be extracted from the brass liner into a ziploc bag and brought to room temperature. The soil will also be described by the onsite geologist in terms of texture, moisture content, staining, odor, and any other pertinent information. The PID probe will be inserted into the bag, and the highest TOV reading measured by the PID will be recorded. A Thermo Environmental Model 580B PID equipped with a 10.0 eV lamp will be used during field screening. The PID will be calibrated with a 100 parts per million (ppm) isobutylene standard at the beginning of each day and periodically during the day.

If there is no evidence of high TOV, based on PID readings, but there is visual or other evidence of degradation, a second subaliquot of soil from each sampling depth will be screened in the field for TRPH. The standard operating procedure for the TRPH analysis is included in Appendix IV-D.

TRPH analysis will be conducted on samples collected in the vicinity of the past oil spill (AOC #16).

Samples from each interval will be held in a cooler or refrigerated at the site until it is determined which samples will be sent to the laboratory based on field screening. The objectives of the soil sampling program are to define the nature, degree, and vertical extent of soil quality degradation in the unsaturated zone. To achieve the soil sampling program objectives, Safety-Kleen will submit for laboratory analysis the following soil samples from each borehole to confirm the field screening results:

1. If field screening indicates no degradation in the unsaturated zone, a sample from immediately below the unit (or immediately below the clean backfill in the oil spill area) will be submitted for laboratory analysis.

2. If field screening indicates degradation in part of the unsaturated zone, one sample will be submitted from the most degraded interval (based on field screening) and second sample will be submitted from the interval below the apparent degradation (based on field screening).

3. If field screening indicates degradation down to ground water, one sample will be submitted from the most degraded interval (based on field screening), and a second sample will be submitted from the interval immediately above the seasonally high water table (estimated at 30 feet below ground surface).

The laboratory samples will be packaged, placed on ice in a cooler (maintained at 4°C), and delivered within 24 hours of sampling to the S-K Environmental Laboratory for analysis. Soil samples will not be composited. All samples will be accompanied by completed chain-of-custody/sample-analysis-request forms.

Decontamination Procedures

Brass rings will be cleaned according to the procedures described below. Glass containers will be pre-cleaned and supplied by an independent supplier. Sample containers will be decontaminated prior to sampling, either in the laboratory or in the field. The sampling devices will be decontaminated in the field immediately prior to and after sampling each site. All sampling equipment will be disassembled into component parts prior to washing.

Field decontamination will include washing the sampling devices and brass rings and caps in a warm non-phosphate detergent solution, rinsing the devices and containers with tap water, and then rinsing the devices with distilled or deionized water. Sampling devices and containers will be dried before use by air drying or with clean paper towels. If a hydrocarbon sheen becomes present on the rinse water during decontamination, the sampling devices and/or containers will be decontaminated again with hexane, fresh wash and rinse water. All washing fluids and rinse water will be discharged to the wet dumpsters at the Pekin facility for proper processing by S-K.

The decontaminated sampling devices and brass rings will be stored in clean plastic bags or ziploc-type bags until use. The brass rings and glass jars may be stored until use in coolers.

Field Documentation

Field observations are critical to the verification and interpretation of the laboratory data. Field observations during soil sampling will be recorded in the field log book. The following information will be recorded in the field notebook where appropriate:

- Date and name of observer
- Names and affiliations of sampling team members

- Names and affiliations of others present at the sampling sites

- Weather conditions

- Sampling location (with measured distances) and time of sampling

- Health and safety data on total organic vapors, etc.

- Health and safety measures implemented (e.g., respirators)

- Sampling site condition upon arrival (concrete cover, standing water, erosion, etc.)

- Soil characteristics and texture

- Soil observations, including discoloration, hydrocarbon sheens, moisture content, etc.

- Deviations from or clarifications of sampling procedures in the Workplan.

- Miscellaneous conditions which the sampling team finds noteworthy.

The project site manager will review and sign the field notes after each day of sampling.

Photographs will be taken of every sampling site. Photographs will also be taken of sampling procedures at one location.

Chain-of-Custody Control

A record of sample possession from "cradle to grave" will be kept in Pekin facility files. The sample tracking starts with the sample container label. Information provided on the sample label will be complete and accurate. A completed chain-of-custody/sample-analysis-request form will accompany each shipment of sample containers from project site to the laboratory. Finally, a custody seal will be placed on the shipping container to minimize the possibility of sample tampering.

Sample Label

Each sample container will be identified with a label. The sample label will be the one shown on Figure IV-2-1 or equivalent. The information which will appear on the sample container label includes:

1. Sample identification number
2. Place of collection (or project number)
3. Date and time of collection
4. Personnel collecting the sample
5. Preservative (none in the case of soil samples)
6. Analyses requested
7. Any special information, such as an estimate of the level of contamination

The brass rings or 2- to 4-ounce glass jars will be used for analysis of volatile organic compounds, semi- volatile organic compounds and eight metals.

Chain-of-Custody Forms

All samples will be accompanied by completed chain-of-custody/sample-analysis-request forms (Figure IV-2-2). The project site manager will keep a copy of this completed form, and another copy will be kept at the Pekin facility.

Custody Seal

If and when the samples leave custody of the sampling team, the shipping container will be sealed with a custody seal to ensure that the samples have not been disturbed during transportation to the laboratory. The laboratory personnel receiving the coolers will note the condition of the seal and the sample containers within on the chain-of-custody/sample-analysis-request form.

Post-Field Activities

The project site manager and field team members are responsible for several activities after the samples have been shipped to the laboratory. The post-field responsibilities

ENVIRONMENTAL SAMPLING SUPPLY

LOT #
SAMPLE ID

SAMPLED BY	DATE
	TIME
LOCATION	PRESERVATIVE
ANALYSIS	CLIENT

9601 San Leandro Street, Oakland, California 94603
(510) 562-4988 (800) 233-8425

FIGURE IV–2–1 :SAMPLE LABEL FORM

ENVIRONMENTAL C[illegible] OF CUSTODY

DATE:

GENERATOR SITE & ADDRESS	PROJECT MANAGER(S)	PHONE & FAX	PROJECT #
			AUTHORIZATION #

SAMPLER'S NAME

ANALYSIS REQUESTED

FIELD SAMPLE ID #	SAMPLE MATRIX	DATE/TIME SAMPLED	# OF CONTAINERS	PRESERVATION METHOD	MINERAL SPIRITS (8015)	TARGET VOA (8240)	P-CRESOL 8040 ☐ 8270 ☐	CADMIUM (7131)	LEAD 7420 ☐ 7421 ☐ 6010 ☐	CHROMIUM (6010)	TOTAL ORGANIC CARBON (9060)	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	OIL & GREASE 413.1 ☐ 413.2 ☐ SM-503 ☐	HYDROCARBONS GC/FID Gas ☐ Diesel ☐ Screen ☐	PCB (8080)	BTEX 602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	EPA 601 ☐ 8310 ☐

COMMENTS/REMARKS: | REQUESTED TAT

SAMPLE TRANSFER RECORD

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
SIGNATURE OF COLLECTOR:					

SK TCLP LAB USE ONLY

TEMPERATURE WHEN RECEIVED ______ °C SHIPPED VIA: ______ UPS ______ FED EX ______ OTHER

SAMPLE KIT OPENED AND CHECKED IN BY: ______ AT ______ ON ______

C.O.C. SEALS SIGNED, DATED, AND INTACT ON ALL SAMPLE JARS? YES ______ NO ______ IF NO, EXPLAIN ______

SHIPPING NOTES/LAB COMMENTS:

FIGURE IV-2-2 :CHAIN-OF-CUSTODY / SAMPLE ANALYSIS REQUEST FORM include laboratory contact, record filing, and equipment checks.

Continued Supervision

The project site manager will call the laboratory on the day the samples are due to arrive at the laboratory to ensure that they have in fact arrived. The project site manager will call the laboratory periodically to make sure that samples are being analyzed within the following holding times:

Volatile Organic Compounds	14 days
Semi-Volatile Organic Compounds	14 days until extraction, 40 days after extraction
Inorganic Constituents (except Mercury)	6 months
Mercury	28 days

Records

The project site manager will collect all pertinent field data (i.e., chain-of-custody, copies of field logbook records, etc.) and file it in the client job file immediately after returning from the field. Proper and efficient management of the sampling records will aid in reviewing and evaluating the laboratory analytical data. The project site manager will also ensure laboratory data are placed in the project file.

Equipment

Any equipment problems noted during sampling and not corrected in the field will be corrected upon return to the office. Broken or contaminated equipment will not be returned to storage for future use.

CHAPTER IV-3

LABORATORY ANALYSIS

Samples will be submitted to S-K Environmental Laboratory for chemical analysis. The laboratory is located in Elk Grove Village, Illinois.

Soil Samples To Be Analyzed

The soil samples to be analyzed are shown in Table IV-3-1. Up to eight background samples (four per soil textured and up to 14 investigative samples will be submitted to the laboratory for chemical analysis. The procedures to select samples for laboratory analysis are described in the previous chapter under "Field Screening." Two samples will be submitted in duplicate for quality assurance. As discussed in the Quality Assurance Project Plan (Part VII of the Workplan), additional quality assurance samples will be prepared in the laboratory for chemical analysis quality control.

Constituent List

The samples will be analyzed for the 107 constituents described in Table IV-3-2. The full constituent list is presented in Appendix IV-B. The constituent list consists of eight metals, 37 volatile organic compounds (VOCs), and 62 semi-volatile organic compounds (SVOCs). The constituent list includes:

- All hazardous constituents detected in soils during previous sampling events at the Pekin facility.

- All hazardous constituents and hazardous waste constituents which might cause some wastes managed at the Pekin facility to be listed or characteristic hazardous wastes (see sections of the Part B Permit in Appendix IV-C).

- Other VOCs and SVOCs commonly analyzed by the S-K Environmental Laboratory using Methods 8240 and 8270 (gas chromatography/mass spectroscopy), respectively.

Table IV-3-1. Soil Samples to be Analyzed, RFI Phase I Release Assessment, Pekin, Illinois Service Center.

Sample Type	Number of Sites	Number of Samples	Constituents	Containers/Site Number	Containers/Site Type	Volume	Preser-vatives
<u>Investigative Samples</u>							
Background	4	4-8	Appendix IV-B	2	Brass rings or 2-4 ounce glass jars	Full	None
SWMUs/AOC	7	7-14	Appendix IV-B	2	Brass rings or 2-4 ounce glass jars	Full	None
<u>Quality Assurance Field Samples</u>							
Background	See above						
SWMU/AOC Blind Duplicates	2		Appendix IV-B	2	Brass rings or 2-4 ounce glass jars	Full	None
<u>Quality Assurance Laboratory Samples</u>							
Matrix Spikes/Matrix Spike Duplicates	*		Organic constituents only	0		NA	NA
Surrogate Spikes	*		Organic constituents only	0		NA	NA

* No additional samples need to be collected for quality assurance laboratory samples.

Table IV-3-2. Constituent List, RFI Phase I Release Assessment, Pekin, Illinois Service Center.

Constituent	Method (from SW-846)	Method Detection Limit (mg/kg)
Inorganics		
Arsenic	7060	1.25
Barium	6010	2.0
Cadmium	6010	2.0
Chromium	6010	4.0
Lead	6010	11.0
Mercury	7471	0.04
Selenium	7740	0.9
Silver	6010	3.0
Organics*		
Volatile Organic Compounds (37)	8240	0.005-0.100
Semi-Volatile Organic Compounds (62)	8270	0.660-3.300

* A complete list of organic compounds and method detection limits for individual compounds are presented in Appendix IV-A.

** Method detection limits are matrix dependent.

Analytical Methods

All analyses will be conducted for the total concentration of each constituent. Analytical methods are referenced in Table IV-3-2, and contained in EPA's SW-846.

The laboratory will attempt through these standardized analytical methods to achieve the method detection limits (MDLs) listed in Table IV-3-2 and Appendix IV-B. However, MDLs are highly matrix dependent. Because Phase I focuses on the most impacted soils (if any), matrix interferences are anticipated. EPA's SW-846 lists modified MDLs for certain methods given matrix interferences (see Table IV-3-3). These modified MDLs will be used to determine completeness (see quality assurance procedures in Part VII of the Workplan).

Holding Times

The laboratory will be instructed to meet the following holding times:

Constituent	Maximum Holding Time
VOCs	14 days
SVOCs	14 days until extraction, 40 days after extraction
Inorganic Constituents (except mercury)	6 months, excluding mercury (28 days)
Mercury	28 days

The laboratory will be requested to provide a laboratory data report within 45 days of sample receipt.

Quality Assurance Procedures

Background soil samples, blind duplicate soil samples, and laboratory-prepared quality assurance samples will be analyzed by the laboratory during the Phase I Release Assessment to evaluate quality control. The quality assurance procedures are described in detail in Part VII of this Workplan.

Table IV-3-3. Revised Method Detection Limits Due to Matrix Interferences, RFI Phase I Release Assessment, Pekin, Illinois Service Center.

Analytical Method	Matrix	Method Detection Limits
8240 (VOCs)	Clean and low-level soils	See MDLs in Appendix IV-B
	High-level soils	Multiply MDLs by 125
8270 (SVOCs)	Clean and low-level soils	See MDLs in Appendix IV-B
	Medium-level soils and sludges by sonication	Multiply MDLs by 7.5
	High-level soils and sludges	Undetermined

Note: These revised method detection limits are based on information in SW-846.

CHAPTER IV-4

REFERENCES

U.S. Environmental Protection Agency, 1987. Test Methods for Evaluating Solid Waste, Revision 1 (SW-846).

APPENDIX IV-A

IEPA SOIL VOLATILES SAMPLING PROCEDURES

Illinois Environmental Protection Agency · P.O. Box 19276, Springfield, IL 62794-9276

ATTACHMENT 1

Soil Volatile Sampling Procedures

Procedure:

A. PREPARATION AND DECONTAMINATION OF SOIL SAMPLER (i.e. STAINLESS STEEL, BRASS, BRONZE, COPPER, etc.). An example of these samplers would be a shelby tube, split-barrel sampler with metal tube inserts or california sampler. These are only examples there maybe more types available. Also, the sample tube must be at least six inches long.

*1. Wash tubing or sampler with hot water and a nonfoaming detergent.

2. Rinse with hot water.

*3. Rinse with a solvent, such as hexane or acetone.

4. Rinse with very hot water to drive off solvent.

5. Rinse with deionized distilled water.

6. Air Dry

7. Store the sampler in aluminum foil until ready for use..

*Consult the laboratory for specific recommendations.

B. SOIL SAMPLING FOR VOLATILE ORGANICS

1. Using a properly decontaminated sampler (refer to preparation and decontamination instructions), push or drive the sampler to obtain a representative soil sample.

2. **DO NOT** remove sample from sample tube in the field. The laboratory should remove the sample from the sampling tube.

3. Immediately add clay or other cohesive material (i.e. wetted bentonite) to the ends of the sample to eliminate head space, if necessary.

4. Cover both ends of the sampler with aluminum foil. If possible, cover the aluminum foil with a cap.

5. Put the sample in storage at 4 degrees centigrade immediately.

6. Transport the samples to the laboratory as soon as possible. Most laboratories require delivery within 24 hours of sampling.

NOTE:

Soil samples which will be tested for volatile organic constituents <u>cannot</u> be composited because of the volatilization which would result from any compositing method.

APPENDIX IV-B

PROJECT CONSTITUENT LIST
PEKIN, ILLINOIS SERVICE CENTER

Table IV-B-1. Inorganic Constituents, RFI Phase I, Pekin, Illinois Service Center.

Constituent	Method	Method Detection Limit (mg/kg)
Arsenic	SW-846 7060	1.25
Barium	SW-846 6010	2.0
Cadmium	SW-846 6010	2.0
Chromium	SW-846 6010	4.0
Lead	SW-846 6010	11.0
Mercury	SW-846 7471	0.04
Selenium	SW-846 7740	0.9
Silver	SW-846 6010	3.0

Table IV-B-2. Volatile Organic Compounds, RFI Phase I, Pekin, Illinois Service Center.

Constituent	Method	Method Detection Limit (mg/kg)
Acetone	SW-846 8240	0.100
Benzene	SW-846 8240	0.005
Bromodichloromethane	SW-846 8240	0.005
Bromoform	SW-846 8240	0.005
Bromomethane	SW-846 8240	0.010
Carbon disulfide	SW-846 8240	0.100
Carbon tetrachloride	SW-846 8240	0.005
Chlorobenzene	SW-846 8240	0.005
Chloroethane	SW-846 8240	0.010
Chloroform	SW-846 8240	0.005
Chloromethane	SW-846 8240	0.010
Dibromochloromethane	SW-846 8240	0.005
1,1-Dichloroethane	SW-846 8240	0.005
1,2-Dichloroethane	SW-846 8240	0.005
1,1-Dichloroethylene	SW-846 8240	0.005
cis-1,2-Dichloroethylene	SW-846 8240	0.005
trans-1,2-Dichloroethylene	SW-846 8240	0.005
1,2-Dichloropropane	SW-846 8240	0.005
cis-1,3-Dichloropropene	SW-846 8240	0.005
trans-1,3-Dichloropropene	SW-846 8240	0.005
Ethylbenzene	SW-846 8240	0.005
2-Hexanone	SW-846 8240	0.050
Methylene chloride	SW-846 8240	0.005
Methyl ethyl ketone	SW-846 8240	0.100
4-Methyl-2-pentanone	SW-846 8240	0.050
Styrene	SW-846 8240	0.005
1,1,2,2-Tetrachloroethane	SW-846 8240	0.005
Tetrachloroethylene	SW-846 8240	0.005
Toluene	SW-846 8240	0.005
1,1,1-Trichloro ethane	SW-846 8240	0.005
1,1,2-Trichloroethane	SW-846 8240	0.005
Trichloroethylene	SW-846 8240	0.005
Trichlorofluoromethane	SW-846 8240	0.010
Trichlorotrifluoroethane	SW-846 8240	0.005
Vinyl Acetate	SW-846 8240	0.050
Vinyl Chloride	SW-846 8240	0.010
Xylene (total)	SW-846 8240	0.005

Table IV-B-3. Semi-Volatile Organic Compounds, RFI Phase I, Pekin, Illinois Service Center.

Constituent	Method	Method Detection Limit (mg/kg)
Acenaphthene	SW-846 8270	0.660
Acenaphthylene	SW-846 8270	0.660
Anthracene	SW-846 8270	0.660
Benzo(a)anthracene	SW-846 8270	0.660
Benzo(b)fluoranthene	SW-846 8270	0.660
Benzo(k)fluoranthene	SW-846 8270	0.660
Benzo(ghi)perylene	SW-846 8270	0.660
Benzo(a)pyrene	SW-846 8270	0.660
Benzyl alcohol	SW-846 8270	1.300
Bis(2-chloroethoxy) methane	SW-846 8270	0.660
Bis(2-chloroethyl) ether	SW-846 8270	0.660
Bis(2-ethylhexyl) phthalate	SW-846 8270	0.660
4-Bromophenyl phenyl ether	SW-846 8270	0.660
Butyl benzyl phthalate	SW-846 8270	0.660
p-Chloroaniline	SW-846 8270	1.300
p-Chloro-m-cresol	SW-846 8270	0.660
2-Chloronaphthalene	SW-846 8270	0.660
2-Chlorophenol	SW-846 8270	0.660
4-Chlorophenyl phenyl ether	SW-846 8270	0.660
Chrysene	SW-846 8270	0.660
m-cresol	SW-846 8270	0.660
o-cresol	SW-846 8270	0.660
p-cresol	SW-846 8270	0.330
Dibenz(a,h)anthracene	SW-846 8270	0.660
Dibenzofuran	SW-846 8270	0.660
Di-n-butyl phthalate	SW-846 8270	0.660
o-Dichlorobenzene	SW-846 8270	0.660
m-Dichlorobenzene	SW-846 8270	0.660
p-Dichlorobenzene	SW-846 8270	0.660
3,3'-Dichloro-benzidine	SW-846 8270	1.300
2,4-Dichlorophenol	SW-846 8270	0.660
Diethyl phthalate	SW-846 8270	0.660
2,4-Dimethylphenol	SW-846 8270	0.660
Dimethyl phthalate	SW-846 8270	0.660
2,4-Dinitrophenol	SW-846 8270	3.300
2,4-Dinitrotoluene	SW-846 8270	0.660
2,6-Dinitrotoluene	SW-846 8270	0.660
Di-n-octyl phthalate	SW-846 8270	0.660
Fluoranthene	SW-846 8270	0.660

Table IV-B-3. Semi-Volatile Organic Compounds, RFI Phase I, Pekin, Illinois Service Center (continued).

Constituent	Method	Method Detection Limit (mg/kg)
Fluorene	SW-846 8270	0.660
Hexachlorobenzene	SW-846 8270	0.660
Hexachlorobutadiene	SW-846 8270	0.660
Hexachlorocyclo-pentadiene	SW-846 8270	0.660
Hexachloroethane	SW-846 8270	0.660
Indeno(1,2,3-c,d) pyrene	SW-846 8270	0.660
Isophorone	SW-846 8270	0.660
2-Methyl-4,6-dinitrophenol	SW-846 8270	1.300
2-Methylnaphthalene	SW-846 8270	0.660
Naphthalene	SW-846 8270	0.660
o-Nitroaniline	SW-846 8270	3.300
m-Nitroaniline	SW-846 8270	3.300
p-Nitroaniline	SW-846 8270	ND
Nitrobenzene	SW-846 8270	0.660
o-Nitrophenol	SW-846 8270	0.660
p-Nitrophenol	SW-846 8270	3.300
Pentachlorophenol	SW-846 8270	3.300
Phenanthrene	SW-846 8270	0.660
Phenol	SW-846 8270	0.660
Pyrene	SW-846 8270	0.660
1,2,4-Trichlorobenzene	SW-846 8270	0.660
2,4,5-Trichlorophenol	SW-846 8270	0.660
2,4,6-Trichlorophenol	SW-846 8270	0.660

ND = Not Determined

APPENDIX IV-C

EXCERPT FROM THE RCRA PERMIT

Attachment A

Wastes which can be accepted and
Hazardous Waste Identification Numbers

ILD093862811

Hazardous Waste No.	Description of Hazardous Waste
A. Characteristically hazardous waste	
D001	Solid waste that exhibits the characteristic of ignitability, but is not listed as a hazardous waste.
D002	Solid waste that exhibits the characteristic of corrosivity, but is not listed as a hazardous waste.
D004	Solid waste exhibiting the characteristic of TCLP toxicity for arsenic at 5.0 mg/l or more.
D005	Solid waste exhibiting the characteristic of TCLP toxicity for barium at 100 mg/l or more.
D006	Solid waste exhibiting the characteristic of TCLP toxicity for cadmium at 1.0 mg/l or more.
D007	Solid waste exhibiting the characteristic of TCLP toxicity for chromium at 5.0 mg/l or more.
D008	Solid waste exhibiting the characteristic of TCLP toxicity for lead at 5.0 mg/l or more.
D009	Solid waste exhibiting the characteristic of TCLP toxicity for mercury at 0.2 mg/l or more.
D010	Solid waste exhibiting the characteristic of TCLP toxicity for selenium at 1.0 mg/l or more.
D011	Solid waste exhibiting the characteristic of TCLP toxicity for silver at 5.0 mg/l or more.
D018	Solid waste exhibiting the characteristic of TCLP toxicity for benzene at 0.5 mg/l or more.
D019	Solid waste exhibiting the characteristic of TCLP toxicity for carbon tetrachloride at 0.5 mg/l or more.
D021	Solid waste exhibiting the characteristic of TCLP toxicity for chlorobenzene at 100.0 mg/l or more.
D022	Solid waste exhibiting the characteristic of TCLP toxicity for chloroform at 6.0 mg/l or more.
D023	Solid waste exhibiting the characteristic of TCLP toxicity for o-cresol at 200.0 mg/l or more.

D024	Solid waste exhibiting the characteristic of TCLP toxicity for m-cresol at 200.0 mg/l or more.
D025	Solid waste exhibiting the characteristic of TCLP toxicity for p-cresol at 200.0 mg/l or more.
D026	Solid waste exhibiting the characteristic of TCLP toxicity for cresol at 200.0 mg/l or more.
D027	Solid waste exhibiting the characteristic of TCLP toxicity for 1,4 dichlorobenzene at 7.5 mg/l or more.
D028	Solid waste exhibiting the characteristic of TCLP toxicity for 1,2 dichloroethane at 0.5 mg/l or more.
D029	Solid waste exhibiting the characteristic of TCLP toxicity for 1,1 dichloroethylene at 0.7 mg/l or more.
D030	Solid waste exhibiting the characteristic of TCLP toxicity for 2,4 dinitrotoluene at 0.13 mg/l or more.
D032	Solid waste exhibiting the characteristic of TCLP toxicity for hexachlorobenzene at 0.13 mg/l or more.
D033	Solid waste exhibiting the characteristic of TCLP toxicity for hexachlorobutadiene at 0.5 mg/l or more.
D034	Solid waste exhibiting the characteristic of TCLP toxicity for hexachloroethane at 3.0 mg/l or more.
D035	Solid waste exhibiting the characteristic of TCLP toxicity for methyl ethyl ketone at 200.0 mg/l or more.
D036	Solid waste exhibiting the characteristic of TCLP toxicity for nitrobenzene at 2.0 mg/l or more.
D037	Solid waste exhibiting the characteristic of TCLP toxicity for pentachlorophenol at 100.0 mg/l or more.
D038	Solid waste exhibiting the characteristic of TCLP toxicity for pyridine at 5.0 mg/l or more.
D039	Solid waste exhibiting the characteristic of TCLP toxicity for tetrachloroethylene at 0.7 mg/l or more.
D040	Solid waste exhibiting the characteristic of TCLP toxicity for trichloroethylene at 0.5 mg/l or more.
D041	Solid waste exhibiting the characteristic of TCLP toxicity for 2,4,5 trichlorophenol at 400.0 mg/l or more.

D042 Solid waste exhibiting the characteristic of TCLP toxicity for 2,4,6 trichlorophenol at 2.0 mg/l or more.

D043 Solid waste exhibiting the characteristic of TCLP toxicity for vinyl chloride at 0.2 mg/l or more.

B. Hazardous wastes from non-specific sources

F002 The following spent halogenated solvents: tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, orthodichlorobenzene, trichlorofluoromethane, 1,1,2-trichloroethane, spent solvent mixtures and blends, and the still bottoms from the recovery of these spent solvents and spent solvent mixtures.

F003 The following spent non-halogenated solvents: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-buryl alcohol, cyclohexanone, methanol, spent solvent mixtures and blends, and the still bottoms from the recovery of these spent solvents and spent solvent mixtures.

F004 The following spent non-halogenated solvents: cresols and cresylic acid, nitrobenzene, spent solvent mixtures and blends, and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

F005 The following spent non-halogenated solvents: toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, 2-nitropropane, spent solvent mixtures and blends, and the still bottoms from the recovery of these spent solvents and spent solvent mixtures.

APPENDIX IV-D

STANDARD OPERATING PROCEDURE
FOR THE TRPH ANALYZER

PROJECT: 010

STANDARD OPERATING PROCEDURE

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS (TRPH) ANALYZER

INFRARED METHOD

October 1993

TABLE OF CONTENTS

1.0 Introduction

TriHydro Corporation screens for Total Recoverable Petroleum Hydrocarbons (TRPH) in soils at sites which have been contaminated by heavier (nonvolatile) hydrocarbons such as diesels and crude oil. The purpose of field screening for TRPH is to estimate the degree and extent of contaminated soils. Based on the field screening results, selected samples are sent to the laboratory to confirm the degree and extent of contamination.

TRPH (EPA Method 418) can be determined either by gravimetric analysis or by infrared spectrophotometry. This document contains instructions on all procedures and considerations necessary to conduct TRPH field analyses using the infrared spectrophotometer method (EPA 418.1). TriHydro uses the GAC TPH PLUS field analyzer in which infrared absorbance is measured at two different wavelengths (corresponding to a C-H vibrational frequency in an aliphatic hydrocarbon and an aromatic hydrocarbon). Comparison of absorbance between sample and reference solutions of known concentration is used to estimate the concentrations of aliphatic and aromatic hydrocarbons in the sample.

2.0 Health and Safety Considerations

Possibly contaminated soils to be analyzed should be handled with gloves to minimize the potential for skin contact. Analyses should be conducted in a well ventilated area to minimize the potential for inhalation of harmful concentrations of vapors. Refer to the Health and Safety Plan for the project to identify potentially harmful contaminants in the soils.

The solvent used to extract hydrocarbons from either soil or water is 1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113). Freon is a moderate health hazard (NIOSH Guideline TWA exposure limit 1000 ppm; IDLH = 4500 ppm; see MSDS, attached). Gloves and protective eyewear should be worn when handling Freon, and a source of clean water should be available to wash eyes or skin that has come into contact with Freon. Since only a small amount is used during analyses, the major potential for high vapor concentrations occurs when transferring Freon between containers. Freon transfer should be done away from area of use in a well ventilated area.

3.0 Responsibilities

Project personnel that would become involved in field screening for TRPH are the project chemist, field technicians, and equipment coordinator. The project chemist is responsible for:

- Organizing all of the instrumentation, supplies, and instruction manuals necessary to conduct analyses in the field;
- Checking out the instrument in the office before it heads to the field to ensure that it is operating properly;
- Ensuring that all personnel scheduled to perform field analyses have been properly trained in sample preparation, instrument operation, and quality assurance procedures;
- Maintaining proper records of all field screening data generated; and
- Ensuring that equipment and procedures are applied in a technically valid manner.

All field technicians performing TRPH analysis must be properly trained in instrument operation, project objectives, sample extraction procedures, health and safety procedures, and the project QA procedures. The field technician is responsible for:

- Review of the Health and Safety Plan and understanding of possible chemical exposures.
- Proper operation and calibration of instrumentation in accordance with equipment manuals and the project work plan; and
- Complete and accurate documentation of field activities, including sampling methods, instrument calibrations, and analytical results.

The equipment coordinator is responsible for:

- Storage of equipment in a limited access area
- Issuance of equipment to project personnel
- Maintenance of equipment, repairs, preventive maintenance, and use.

4.0 Required Materials

- VOAs for Freon extraction
- Freon (HPLC grade or equivalent)
- Disposable plastic syringes with filters for trapping clays, dispensing Freon solutions into cuvettes;
- Voltmeter for checking gain on TRPH instrument
- Cuvettes (at least three; 2 for standards, one for samples)
- Glass syringe (two parts)
- Syringe replacement parts (O-rings, syringe-red cap connector)
- Notebook for sample and calibration results
- Standard solutions (to be kept in small cooler)
- Freon dispenser
- Plastic bags/ markers for samples before analysis
- Paper towels and lens paper
- Battery operated balance for weighing samples
- Silica gel
- Plastic spoons for soil transfer
- Battery pack and 2 adapters (recharge adapter/TRPH adapter)
- TRPH analyzer and AC-DC adapter
- Small screwdriver (to adjust gain if necessary)

5.0 Procedures

5.1 Zeroing the TRPH Analyzer

Use the following procedure:

Step 1 Place the black probe (negative) in the upper left ground receptacle on board #1. Leave the negative probe here for the entire process.

Step 2 Place the red probe (positive) from the voltmeter in the TP3 receptacle on board #7.

Step 3 Change the gain- coarse and fine adjustments so that the voltmeter reads 5.0 mV.

Step 4 Place the positive probe in the TP3 receptacle on board #6. Again, change the gain- fine and coarse adjustments to allow the voltmeter to read 5.0 mV.

Step 5 Place the positive probe in the TP3 receptacle in board #5. Once again change the gain- fine and coarse adjustment to allow the meter to read 5.o mV.

Step 6 Place the positive probe in the IN receptacle on board #2. Then adjust the small zero (blue) on board #1 to make the voltmeter read 0.

Step 7 Place the positive probe in the IN receptacle on board #4. Then adjust the small zero (blue) on board #3 to make the voltmeter read 0.

5.2 Calibration Standards

It is important to calibrate the TRPH response against reference Freon solutions with hydrocarbon concentrations in the expected range of the field samples (recommended range: at least 20-200 mg/kg). It is recommended that at least three standards be used in order to check for linearity. Standard reference materials are least expensive and most easily obtained from (local) analytical labs. The standard reference material used is EPA reference oil 418.1 (25% chlorobenzene, 37.5% iso-octane, 37.5% hexadecane). Inter Mountain Laboratories (1-800-828-1095) uses a paraffin standard which gives a response similar to the EPA reference oil, which can be used for calibrating the aliphatic hydrocarbon response ONLY. TriHydro has also used mineral spirits and a client's crude oil sample in specialized situations. Calibration solutions have a shelf life of around a month if kept refrigerated. If these are kept in VOAs, it is imperative that the septum not be inverted. The top of the VOA septum is soluble in Freon, and inversion will contaminate the standard solutions.

Since the response of the TRPH will vary between specific aliphatic and aromatic compounds, more precise quantitation is attainable if calibration is done with Freon solutions of the specific compounds to be analyzed. However, given the reconnaissance nature of field TRPH use, and other limits to quantitative determinations, this is generally not useful.

When properly calibrated (with EPA 418.1 Reference Oil) the General Analysis Corporation TRPH PLUS analyzer should have SPAN and ZERO readings of 400 to 600 (both aliphatic and aromatic). A logbook of these calibrations should be kept with the TRPH.

5.3 TRPH Measurement

See GAC manual for schematics and instructions.

1. Weigh a clean, empty, labeled VOA vial with cap, on the balance.

2. Transfer approximately 20 g. of soil (1/3-1/2 of vial) to the vial, cap and weigh. Record the weight.

3. Remove the cap, and add enough silica gel to desiccate the sample. The sample should have an appearance of dry sand and should not stick or clump.

4. Dispense 15-20 mL of Freon into the vial using the automated dispenser. The quantity of Freon should be such that there is some liquid covering the soil. Record the exact volume of freon added.

5. Check the vial lip and threads to ensure that there is no soil present, and tightly cap the vial.

6. Shake the vial for approximately 30 seconds and allow to settle for 10-15 minutes. Shake a second time, and allow the soil to settle.

7. Attach the small filter to the bottom of the plastic syringe barrel, and transfer as much of the Freon as possible using care to minimize the amount of soil carried along.

8. Attach the syringe adaptor and glass syringe to the filter system and pressurize the system.

9. Discard the first few drops through the system. Place the cuvette under the filter assembly and collect a representative sample. Cap the cuvette.

10. Wipe the clear windows of the cuvette with a tissue and place the cell in the cell chamber of the previously zeroed and calibrated TRPH unit.

11. Record the instrument readings at the wavelengths for aliphatic and aromatic hydrocarbons.

12. Calculate the relative concentrations of TRPH in the sample.

$$TRPH = \frac{A \times B}{C}$$

where A = Volume of Freon used (in mL)
B = Instrument reading (mg/L)
C = Weight of soil in grams.

and TRPH is in ppm.

6.0 Quality Control Checks and Acceptance Criteria

6.1 Temperature Control

The electronics of the TRPH analyzer will perform most reliably under constant temperature in the range of 55-80°F. During projects conducted in hot or cold weather, it is advisable to set up TRPH analyzer in a temperature controlled environment, such as an office trailer.

6.2 Cuvette Use

The most likely reason for a small false positive reading on the TRPH is an unclean cuvette window. The quartz cuvettes ($150 each) should be handled carefully by the frosted sides, and by clean hands or gloves only. Each cuvette has a batch number embossed at the top on one of the nonfrosted sides. A consistent directional convention should be used when placing the cuvette in the cuvette holder (i.e., number always to the right). Cuvettes should zero at the same place regardless of batch number. Cuvette windows should be cleaned using non-scratch lens paper before each use.

The most likely error in a TRPH analysis will be a false positive. Therefore, positive readings should be treated with caution. After obtaining a positive reading, it is advisable to remove the cuvette and rewipe the glass windows with lens paper to make sure they are completely clean, and reanalyze. If a positive reading is still obtained, discard the sample (or transfer to a second clean cuvette), rinse the original cuvette with Freon, and run a blank.

6.3 Syringe Use

Another likely reason for a false positive reading on the TRPH is the transfer of small particles of clay into the cuvette. This should be prevented through capture by the filter system in the disposable syringe. These should be inspected prior to use to ensure that they are clean and that the filter rests properly and securely at the bottom of the syringe.

6.4 Recalibration

The gain and zero on the electronics boards in the TRPH should be properly adjusted prior to taking the TRPH out in the field, and should be checked (with voltmeter) daily in the field.

After calibration with standards, two standard solutions should be kept in cuvettes (capped to prevent evaporation). These should be reanalyzed at routine intervals to verify calibration. During recalibration, adjust the SPAN knob to obtain the proper reading. Based on experience, adjustments of approximately 30 units may be necessary during the course of a day.

6.5 Instrument Blanks

Two Freon blanks with two different cuvettes should be run prior to calibrating TRPH. The field analyst should test pure Freon from a known clean source, as well as the Freon to be used for sample analysis. Agreement between two cuvettes, and between two sources of Freon will be used as criteria for establishing a "Zero" baseline. A cuvette blank using the sample cuvette should be run after each investigative sample. If "zero" is not obtained, rinse and clean cuvette again. If zero is still not obtained, analyzed blank in a second clean cuvette. Adjust "zero" knob, if necessary.

6.6 Syringe Blank

A syringe blank should be run once per day. Pure Freon should be drawn into the disposable syringe and extracted through the filter into the cuvette. This should be analyzed as a blank to verify that an IR absorbing compound is not being transferred via the filtration system.

6.7 Sample Duplicates

Sample duplicates should be run at a frequency of at least one per ten investigative samples. Samples preferred to be run in duplicate are those with concentrations which appear to be inconsistent with related data and/or with concentrations near critical levels such as clean-up objectives. Due to soil heterogeneity and uncertainty related to the extraction process, sample duplicates (separate extractions) may differ by >30%. If disparity between duplicates exceeds this amount, increase amount of Freon used (to 25 mL) and ensure that consecutive aliquots of the same extraction yield the same results. Note disparities in notebook.

7.0 Documentation

A logbook of SPAN and ZERO settings should be kept with the TRPH analyzer. This can be used to quickly check for variation in the electronic response which may indicate a need for repair. This can also be used to compare standardizations in the event that different reference compounds are used for calibration.

All sample analyses should be accompanied by written records of SPAN and ZERO settings, calibration solutions, (compound, concentration, date of acquisition), the date, site name, project number, and analyst name.

8.0 Disposal of Freon

Arrangements to dispose of spent Freon must be made in advance. Freon is listed as a TSCA hazardous substance and is subject to SARA regulation 313, meaning that producers/users of large amounts need to carefully document (cradle to grave) what they use. This does not apply to the small amounts we use, but makes disposal difficult. Spent Freon cannot be discarded at the project site. It is recommended that the analytical lab being used for an investigation be contacted for disposal of Freon. Alternatively, a hazardous waste recycler can be contacted directly.

ATTACHMENT 1

MSDS FOR FREON

J.T.BAKER INC. 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865
M A T E R I A L   S A F E T Y   D A T A   S H E E T
24-HOUR EMERGENCY TELEPHONE -- (908) 859-2151
CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8802

T.BAKER INC., 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865

SECTION I - PRODUCT IDENTIFICATION

:ODUCT NAME: 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE
)MMON SYNONYMS: FREON 113; FLUOROCARBON 113; 1,1,2-TRICHLOROTRIFLUOROETHANE
IEMICAL FAMILY: CHLORINATED HYDROCARBONS
)RMULA: CL2FCCF2CL
)RMULA WT.: 187.38
\S NO.: 76-13-1
:OSH/RTECS NO.: KJ4000000
{ODUCT USE: LABORATORY REAGENT
{ODUCT CODES: 9337,9445,9343,9347,W591,9053

PRECAUTIONARY LABELING

SAF-T-DATA* SYSTEM

HEALTH	-	2	MODERATE
FLAMMABILITY	-	1	SLIGHT
REACTIVITY	-	0	NONE
CONTACT	-	2	MODERATE

\BORATORY PROTECTIVE EQUIPMENT

)GGLES; LAB COAT; VENT HOOD; PROPER GLOVES

U.S. PRECAUTIONARY LABELING

WARNING

\USES IRRITATION. HARMFUL IF INHALED.
/OID CONTACT WITH EYES, SKIN, CLOTHING. KEEP IN TIGHTLY CLOSED CONTAINER.
\SH THOROUGHLY AFTER HANDLING.

INTERNATIONAL LABELING

/OID CONTACT WITH EYES. AFTER CONTACT WITH SKIN, WASH IMMEDIATELY WITH
_ENTY OF WATER. KEEP CONTAINER TIGHTLY CLOSED.

\F-T-DATA* STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)

CONTINUED ON PAGE: 2

SECTION II - COMPONENTS

)MPONENT	CAS NO.	WEIGHT %	OSHA/PEL	ACGIH/TLV
:ICHLOROTRIFLUOROETHANE	76-13-1	90-100	1000 PPM	1000 PPM

SECTION III - PHYSICAL DATA

)ILING POINT: 48 C (118 F)
(AT 760 MM HG)

VAPOR PRESSURE (MMHG): 285
(20 C)

:LTING POINT: -35 C (-31 F)
(AT 760 MM HG)

VAPOR DENSITY (AIR=1): 6.5

'ECIFIC GRAVITY: 1.57
''20=1)

EVAPORATION RATE: 0.45
(ACETONE = 1)

JBILITY(H2O): 0.028%

% VOLATILES BY VOLUME: 100
(21 C)

-I: 7.0

DOR THRESHOLD (P.P.M.): N/A

PHYSICAL STATE: LIQUID

JEFFICIENT WATER/OIL DISTRIBUTION: N/A

PPEARANCE & ODOR: CLEAR, COLORLESS LIQUID. FAINT ETHER-LIKE ODOR.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

LASH POINT (CLOSED CUP): N/A

UTOIGNITION TEMPERATURE: N/A

LAMMABLE LIMITS: UPPER - N/A   LOWER - N/A

IRE EXTINQUISHING MEDIA
USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

AL FIRE-FIGHTING PROCEDURES
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE. MOVE CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

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SECTION IV - FIRE AND EXPLOSION HAZARD DATA (CONTINUED)

USUAL FIRE & EXPLOSION HAZARDS
CLOSED CONTAINERS EXPOSED TO HEAT MAY EXPLODE.

XIC GASES PRODUCED
HALOGEN ACIDS, CARBON MONOXIDE, CARBON DIOXIDE, PHOSGENE, HALOGENS, CARBONYL HALIDES

PLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT
NONE IDENTIFIED.

PLOSION DATA-SENSITIVITY TO STATIC DISCHARGE
NONE IDENTIFIED.

SECTION V - HEALTH HAZARD DATA

IRESHOLD LIMIT VALUE (TLV/TWA): 7600 MG/M3   (1000 PPM)

IORT-TERM EXPOSURE LIMIT (STEL): 9500 MG/M3   (1250 PPM)

ERMISSIBLE EXPOSURE LIMIT (PEL): 7600 MG/M3   (1000 PPM)

IXICITY OF COMPONENTS

RAL RAT LD50 FOR TRICHLOROTRIFLUOROETHANE   43   G/KG
ARCINOGENICITY: NTP: NO   IARC: NO   Z LIST: NO   OSHA REG: NO

ARCINOGENICITY
NONE IDENTIFIED.

EPRODUCTIVE EFFECTS
NONE IDENTIFIED.

FFECTS OF OVEREXPOSURE

INHALATION: HEADACHE, NAUSEA, VOMITING, DIZZINESS, DROWSINESS, NARCOSIS, IRRITATION OF UPPER RESPIRATORY TRACT, UNCONSCIOUSNESS, MAY BE FATAL

KIN CONTACT: PROLONGED CONTACT MAY CAUSE IRRITATION, DERMATITIS

CONTINUED ON PAGE: 4

SECTION V - HEALTH HAZARD DATA (CONTINUED)

EYE CONTACT: IRRITATION

SKIN ABSORPTION: NONE IDENTIFIED

INGESTION: GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING

CHRONIC EFFECTS: NONE IDENTIFIED

RGET ORGANS
SKIN, HEART

DICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
CARDIOVASCULAR DISORDERS, CENTRAL NERVOUS SYSTEM DISORDERS

IMARY ROUTES OF ENTRY
HALATION, INGESTION, EYE CONTACT, SKIN CONTACT

IERGENCY AND FIRST AID PROCEDURES

INGESTION: CALL A PHYSICIAN. IF SWALLOWED, DO NOT INDUCE VOMITING.

INHALATION: IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.

SKIN CONTACT: IN CASE OF CONTACT, FLUSH SKIN WITH WATER.

EYE CONTACT: IN CASE OF EYE CONTACT, IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

ITES TO PHYSICIAN
DO NOT USE ADRENALIN OR EPINEPHRINE.

SARA/TITLE III HAZARD CATEGORIES AND LISTS

UTE: YES CHRONIC: YES FLAMMABILITY: NO PRESSURE: NO REACTIVITY: NO

TREMELY HAZARDOUS SUBSTANCE: NO
RCLA HAZARDOUS SUBSTANCE: NO
RA 313 TOXIC CHEMICALS: YES CONTAINS CHLORINATED FLUOROCARBON (FREON 113)
GENERIC CLASS: C02

CONTINUED ON PAGE: 5

J.T.BAKER INC. 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865

M A T E R I A L   S A F E T Y   D A T A   S H E E T

24-HOUR EMERGENCY TELEPHONE -- (908) 859-2151
CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8802

SECTION V - HEALTH HAZARD DATA (CONTINUED)

CA INVENTORY: YES

SECTION VI - REACTIVITY DATA

ABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

NDITIONS TO AVOID: HEAT, FLAME, OTHER SOURCES OF IGNITION

COMPATIBLES: ALKALI METALS, CHEMICALLY ACTIVE METALS, ZINC, ALUMINUM, MAGNESIUM, STRONG OXIDIZING AGENTS

COMPOSITION PRODUCTS: HALOGEN ACIDS, CARBON MONOXIDE, CARBON DIOXIDE, PHOSGENE, HALOGENS, CARBONYL HALIDES

SECTION VII - SPILL & DISPOSAL PROCEDURES

EPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE

WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. SHUT OFF IGNITION SOURCES; NO FLARES, SMOKING OR FLAMES IN AREA. STOP LEAK IF YOU CAN DO SO WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. TAKE UP WITH SAND OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIAL AND PLACE INTO CONTAINER FOR LATER DISPOSAL. FLUSH AREA WITH WATER.

:SPOSAL PROCEDURE

DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

!UATIC TOXICITY

FATHEAD MINNOW 96HR-LC50 = 1250 PPM.

SECTION VIII - INDUSTRIAL PROTECTIVE EQUIPMENT

:NTILATION: USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.

IRATORY PROTECTION: RESPIRATORY PROTECTION REQUIRED IF AIRBORNE CONCENTRATION EXCEEDS TLV. AT CONCENTRATIONS ABOVE 1000 PPM, A SELF-CONTAINED BREATHING APPARATUS IS ADVISED.

CONTINUED ON PAGE: 6

SECTION VIII - INDUSTRIAL PROTECTIVE EQUIPMENT (CONTINUED)

'E/SKIN PROTECTION: SAFETY GOGGLES, UNIFORM, APRON, POLYVINYL ALCOHOL GLOVES ARE RECOMMENDED.

SECTION IX - STORAGE AND HANDLING PRECAUTIONS

ıF-T-DATA* STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)

'ORAGE REQUIREMENTS
KEEP CONTAINER TIGHTLY CLOSED. SUITABLE FOR ANY GENERAL CHEMICAL STORAGE AREA. STORE BELOW 45 C.

SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

]MESTIC (D.O.T.)

ROPER SHIPPING NAME: CHEMICALS, N.O.S. (NON-REGULATED)

ITERNATIONAL (I.M.O.)

ROPER SHIPPING NAME: CHEMICALS, N.O.S. (NON-REGULATED)
MARINE POLLUTANTS: NO

IR (I.C.A.O.)

ROPER SHIPPING NAME: CHEMICALS, N.O.S. (NON-REGULATED)

.S. CUSTOMS HARMONIZATION NUMBER: 29034050201

PA/TSCA EXPORT NOTIFICATION
YES

CONTINUED ON PAGE: 7

===

/A = NOT APPLICABLE OR NOT AVAILABLE
/E = NOT ESTABLISHED
--
HE INFORMATION IN THIS MATERIAL SAFETY DATA SHEET MEETS THE EQUIREMENTS OF THE UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ACT AND EGULATIONS PROMULGATED THEREUNDER (29 CFR 1910.1200 ET. SEQ.) AND THE ANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. THIS DOCUMENT S INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF HE MATERIAL BY A PERSON TRAINED IN, OR SUPERVISED BY A PERSON TRAINED N, CHEMICAL HANDLING. THE USER IS RESPONSIBLE FOR DETERMINING THE RECAUTIONS AND DANGERS OF THIS CHEMICAL FOR HIS OR HER PARTICULAR PPLICATION. DEPENDING ON USAGE, PROTECTIVE CLOTHING INCLUDING EYE AND ACE GUARDS AND RESPIRATORS MUST BE USED TO AVOID CONTACT WITH MATERIAL R BREATHING CHEMICAL VAPORS/FUMES.
XPOSURE TO THIS PRODUCT MAY HAVE SERIOUS ADVERSE HEALTH EFFECTS. THIS HEMICAL MAY INTERACT WITH OTHER SUBSTANCES. SINCE THE POTENTIAL USES R ?O VARIED, BAKER CANNOT WARN OF ALL OF THE POTENTIAL DANGERS OF USE NTERACTION WITH OTHER CHEMICALS OR MATERIALS. BAKER WARRANTS THAT ... CHEMICAL MEETS THE SPECIFICATIONS SET FORTH ON THE LABEL.
AKER DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD O THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS OR A PARTICULAR PURPOSE.
HE USER SHOULD RECOGNIZE THAT THIS PRODUCT CAN CAUSE SEVERE INJURY AND VEN DEATH, ESPECIALLY IF IMPROPERLY HANDLED OR THE KNOWN DANGERS OF USE RE NOT HEEDED. READ ALL PRECAUTIONARY INFORMATION. AS NEW DOCUMENTED ENERAL SAFETY INFORMATION BECOMES AVAILABLE, BAKER WILL PERIODICALLY EVISE THIS MATERIAL SAFETY DATA SHEET.
OTE: CHEMTREC, CANUTEC, AND NATIONAL RESPONSE CENTER EMERGENCY TELEPHONE UMBERS ARE TO BE USED ONLY IN THE EVENT OF CHEMICAL EMERGENCIES INVOLVING SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT INVOLVING CHEMICALS. ALL ON-EMERGENCY QUESTIONS SHOULD BE DIRECTED TO CUSTOMER SERVICE 1-800-JTBAKER) FOR ASSISTANCE.

===
PPROVED BY QUALITY ASSURANCE DEPARTMENT.

-- LAST PAGE --
"ISSUED BY VWR 09/25/92"

PART V